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FIELD IMPLEMENTATION PLAN FOR THE SOURCE REMOVAL AT TRENCH 1 IHSS 108

RF/RMRS-98-223

April, 1998
Revision 0

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ADMINISTRATIVE INFORMATION

Site: Rocky Flats Environmental Technology Site, Golden, Colorado

Project Name: Source Removal at Trench 1 - IHSS 108

Date Prepared: April 28, 1998

Approvals

I have read and approved this Field Implementation Plan with respect to project procedures and the planned implementation of the Trench 1 Source Removal.

Wayne Sproles — Date: 4/28/98
RMRS Project Manager

Greg DiGregorio — Date: 4/28/98
RMRS Quality Assurance

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RMRS Health and Safety Supervisor

Ken Gillespie — Date: 4/28/98
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Starmet Project Manager

Nick Lombardo — Date
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ADMINISTRATIVE INFORMATION

Site:	Rocky Flats Environmental Technology Site, Golden, Colorado
Project Name:	Stream Removal at Trench 1 - RMRS 108
Date Prepared:	April 28, 1998

Approvals

I have read and approved this Field Implementation Plan with respect to project procedures and the planned implementation of the Trench 1 Stream Removal.

William Spratlen RMRS Project Manager	Date
Chip Dicharry RMRS Quality Assurance	Date
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Tom Gillespie RMRS Site Safety Officer	Date
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Don Metzler Stream Project Manager	Date
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LIST OF ACRONYMS

ALARA.....As Low As Reasonably Achievable
CA.....Contamination Area
CAM .....Continuous Air Monitor
COOP.....Conduct of Operations
CWTF .....Consolidated Water Treatment Facility
ft^3..... .Cubic Foot
DOT.....Department of Transportation
DOE/RFFO.....Department of Energy/Rocky Flats Field Office
DCI .....DynCorp of Colorado, Inc.
ER.....Environmental Restoration
eV .....Electron Volt
FID .....Flame Ionization Detector
FIDLER .....Field Instrument for the Detection of Low Energy Radiation
FIP .....Field Implementation Plan
FO.....Field Operations Standard Operating Procedure
HASP.....Health and Safety Plan
HCA .....High Contamination Area
HEPA.....High Efficiency Particulate Air
HSS.....Health and Safety Specialist
IDLH .....Immediate Danger to Life and Health
IHSS .....Individual Hazardous Substance Site
IWCP.....Integrated Work Control Package
K-H.....Kaiser-Hill Company, Inc.
OVA.....Organic Vapor Analyzer
OSHA.....Occupational Safety and Health Administration
PAM .....Proposed Action Memorandum
PID .....Photoionization Detector
PPE .....Personal Protective Equipment
psi.....Pounds Per Square Inch
QA.....Quality Assurance
QC.....Quality Control
RAAMP .....Radioactive Ambient Air Monitoring Program
RBA.....Radiological Buffer Area
RCRA.....Resource Conservation and Recovery Act
RCT.....Radiological Control Technician

LIST OF ACRONYMS (continued)

RFETS .....Rocky Flats Environmental Technology Site
RTG.....Resource Technologies Group, Inc.
RMRS .....Rocky Mountain Remediation Services, L.L.C.
RWP .....Radiological Work Permit
SAP.....Sampling Analysis Plan
SCA.....Soil Contamination Area
SIP .....Sampling and Inerting Pad
SCBA.....Self Contained Breathing Apparatus
SSOC.....Safe Sites of Colorado, Inc.
TDU.....Thermal Desorption Unit
VOCs .....Volatile Organic Compounds
yd^3..... Cubic Yard

LIST OF STANDARD OPERATING PROCEDURES (SOPs)

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1.0 INTRODUCTION

This Field Implementation Plan (FIP) describes the tasks and operations required to complete the Trench 1 - Individual Hazardous Substance Site (IHSS) 108 Source Removal Project (Figure 1-1). The objective of the Trench 1 Source Removal Project is to excavate drums containing depleted uranium chips and machine turnings, associated radiologically contaminated soil, and other wastes and debris buried in Trench 1. All soil contaminated above the Tier I subsurface soil action levels for radionuclides and volatile organic compounds, as specified in the *Rocky Flats Cleanup Agreement* (RFCA) (DOE, 1996), will be removed from the trench. The potentially pyrophoric depleted uranium materials and associated contaminated soil and debris will be packaged and inerted onsite for shipment and off-site treatment and disposal. The depleted uranium materials will be inerted to remove their potential pyrophoric characteristic. Background information on the Trench 1 Source Removal Project is presented in the *Final Proposed Action Memorandum (PAM) for the Source Removal at Trench 1, IHSS 108* (RMRS, 1998a).

The Trench 1 Source Removal Project is a mission activity at the Rocky Flats Environmental Technology Site (RFETS) to reduce the human health and environmental risk associated with the buried radioactive waste on behalf of Kaiser-Hill Company, Inc., (K-H) for the U.S. Department of Energy/Rocky Flats Field Office (DOE/RFFO). In addition to this FIP, the work control documents for the Trench 1 project include the following:

- *Final Proposed Action Memorandum (PAM) for the Source Removal at Trench 1, IHSS 108* (RMRS, 1998a);
- *Site-Specific Health and Safety Plan for the Source Removal at Trench 1 Site, IHSS 108*, (RMRS, 1998b);
- *Sampling Analysis Plan (SAP) to Support the Source Removal at the Trench T-1 Site, IHSS 108*, (RMRS, 1998c);
- *Safety Analysis for Individual Hazardous Substance Site (IHSS) 108, Trench 1 (T-1) Source Removal Project* (RMRS, 1998d);
- *Starmet Pyrophoric Depleted Uranium Source Removal from RFETS T-1 Trench (IHSS 108) Work Plan*, (Starmet, 1998a);
- *Starmet Pyrophoric Depleted Uranium Source Removal from RFETS T-1 Trench (IHSS 108) Sampling and Analysis Plan*, (Starmet, 1998c);
- *Starmet Pyrophoric Depleted Uranium Source Removal from RFETS T-1 Trench (IHSS 108) Quality Assurance Project Plan*, (Starmet, 1998d); and

the task-specific Integrated Work Control Packages (IWCPs), as well as DOE Orders, RFETS policies and procedures, and RMRS Environmental Restoration (ER) Operations Orders. Conduct of Operations (COOP) will be conducted in a manner consistent with RFETS goals, objectives, and approved procedures in accordance with DOE Order 5480.19. Implementation of COOP for the

Trench 1 Source Removal Project is summarized in Appendix A. With the exception of the off-site treatment activities, the Trench 1 Source Removal tasks and operations described below will be performed under the *Trench 1 Quality Assurance Implementation Plan* (Appendix B).

2.0 SITE LAYOUT

The Trench 1 remediation activities will be performed within a temporary structure (i.e., Sprung Instant Structure) which will allow work to continue during inclement weather (Figure 2-1). The structure will provide a protected environment for excavating and managing the depleted uranium materials, as well as, protection from high wind and precipitation events common at RFETS between April and September. The structure will be "L" shaped with the long east-west leg encompassing the trench and providing a work area for packaging and inerting the depleted uranium materials. The north-south leg will be designated for stockpiling excavated soil.

Figure 2-2 shows the Temporary Structure layout including the work areas controlled for radiological purposes: High Contamination Area (HCA), Contamination Area (CA), and Radiological Buffer Area (RBA) per the site-specific HASP (RMRS, 1998b). The HCA is defined as the area of the project site requiring the most restrictive Personal Protective Equipment (PPE) for access. The HCA includes the trench excavation area, the area occupied by the Sampling and Inerting Pad (SIP), and the soil stockpile area. The CA located at the southeast corner of the structure will be utilized for equipment and material staging, and releasing waste packages from the structure. Work within the HCA and CA will be performed in Level B protective equipment, or as designated in the HASP.

The Sampling and Inerting Pad (SIP) will be used by the subcontractor to receive and manage the excavated wastes as described in Section 6.4. The SIP will be located inside the west end of the temporary structure in close proximity to the excavation. The SIP will consist of a 20' by 50' soil-bermed pad lined with an HDPE synthetic liner, covered with a layer of soil or gravel for liner protection.

3.0 PROJECT ORGANIZATION AND SITE SUPPORT

Project personnel responsibilities and authorities are presented in ER *Operations Order No. OO-T1-02, Organization, Roles and Responsibilities.* A project phone list is presented in Appendix C of this FIP.

Rocky Mountain Remediation Services, L.L.C. (RMRS) will manage the project and coordinate support for this accelerated source removal action through the appropriate RFETS contractor or subcontractor. The RMRS Radiological Controls Compliance Group will provide radiological safety and controls support for the project per the *RFETS Radiological Control Manual* (K-H, 1996). RMRS will act as the Trench 1 project waste generator and will coordinate and provide support for the project waste management and waste disposal operations.

DynCorp of Colorado, Inc. (DCI) will provide heavy equipment operators, laborers, fuel for the heavy equipment, transportation of materials and supplies to the site, transportation of empty waste packages to the site, and transportation of full waste packages to designated storage units. Resource Technologies Group, Inc. (RTG) will provide Health and Safety Specialists hygienists, sample data coordination, decontamination, and potable water services. K-H Environmental Compliance will assist with requirements for air monitoring and ecological support for the project. K-H will conduct the required waste package inspections and maintain records to meet waste package certification requirements.

Starmet Corporation (Starmet) has been subcontracted to receive excavated potentially pyrophoric materials at the SIP, sample and inert the materials appropriately, and package them for appropriate disposition. Starmet will also provide transportation of the inerted depleted uranium waste from RFETS to the Starmet treatment facility in Barnwell, South Carolina. Starmet will perform treatment of the depleted uranium waste to render it non-pyrophoric and to meet the waste acceptance criteria of the selected disposal facility.

4.0 HEALTH AND SAFETY

The RMRS Site-Specific Health and Safety Plan (HASP) for the Source Removal at Trench 1 (RMRS, 1998b) is the lead document for worker health and safety. This HASP applies to RFETS contractors, subcontractors, and visitors involved in operations, management, or administration at the Trench 1 site. The HASP addresses the hazards associated with each phase of the project and establishes guidelines to protect project personnel, collocated workers, the general public, equipment, and the environment during field activities. Should additional tasks with activities and hazards similar to those addressed in this HASP arise during the course of the project, a task specific Activity Hazard Analysis will be developed and incorporated into the HASP.

Monitoring of environmental conditions inside and outside of the temporary structure will be performed as described in Section 7.0 of the HASP. Work inside the temporary structure will be performed in Level B protective equipment, or as designated in the HASP. RMRS will conduct training specific to the supplied air equipment used at the site per the ER *Operations Order No. OO-T1-05, Use of Self Contained Breathing Apparatus and Supplied Air Line System*, before initiation of field activities.

Project-specific training required for the implementation of the Trench 1 Source Removal Project is described in detail in Section 6.0 of the HASP. The project-specific training matrix has been prepared as part of the RMRS Readiness Review Checklist (ADM-18.03). Project personnel will be required to receive the training designated in the HASP prior to performing any field activities. Personnel entering areas controlled for radiological purposes will comply with the requirements of the task-specific Radiological Work Permit (RWP) for those areas.

5.0 PUBLIC AND MEDIA RELATIONS

The public and media relations will be coordinated through the RMRS Director of Environmental Restoration Projects and the K-H Environmental Restoration Program Manager. RMRS project personnel will coordinate with the RFETS subcontractor for photographic support and documentation.

Visitor access control to the project site will be as specified in Section 6.6 of the HASP (RMRS, 1998b). All site visitors will be given a site-specific orientation tour by the Field Operations Deputy Project Manager or designee as specified in ER *Operations Order No. OO-T1-03, Visitor Orientation.* Prior to entering the site, visitors will provide the Site Safety Officer with documentation of the required training described in Section 6.2 of the HASP. Visitors without the required training shall only be allowed in the project support zone, and must be escorted by designated and trained project personnel.

6.0 SOURCE REMOVAL ACTION

The Trench 1 source removal action will involve excavating the drums containing depleted uranium wastes, and excavating any debris and potentially contaminated soil buried in the trench. At the completion of remediation activities, the site will be restored to improved natural conditions.

The potentially pyrophoric depleted uranium wastes will be packaged and inerted by Starmet at the SIP within the temporary structure. The inerted depleted uranium waste packages will be loaded into 45-foot closed vans, or other appropriate transports, and shipped off-site for treatment (recycling) and disposal. The off-site treatment process will address potential pyrophoricity of the depleted uranium to meet disposal facility requirements. A general description of the treatment process is provided in Section 6.15.

Other wastes encountered in the trench will be excavated, sampled, packaged, and staged for appropriate off-site disposal. Excavated soil will be segregated, sampled and staged for treatment and/or disposal or reuse as backfill material.

6.1 EXCAVATION OF SOIL, DRUMS, DEBRIS, UNKNOWN MATERIALS, AND SUSPECTED CLASSIFIED ITEMS

Excavation activities will consist of excavating and staging of soil, depleted uranium chips/turnings in drums, miscellaneous trash and debris, and any other wastes that may be buried in the trench. It is estimated that Trench 1 contains from 1,500 to 1,800 cubic yards of material including drums containing depleted uranium, cemented cyanide waste, and still bottoms; miscellaneous debris and trash; and soil used to backfill the trench. Reference markers (wooden stakes or pin flags) will be placed on the north side of the trench prior to beginning excavation activities to document sampling locations and locations of excavated materials relative to the excavation boundaries.

The trench contents will be excavated with a track-mounted excavator. Excavation will proceed from the west to east, with the excavator positioned on top of the un-excavated portion of the trench. A designated spotter will assist the excavator operator, from the side of the excavation, to position the excavator over the trench, locate the excavator bucket inside the excavation, and watch for unanticipated hazards or conditions. The spotter will communicate with the operator using a hand-held radio and/or hand signals.

Material removed from the trench will be initially characterized adjacent to the trench, through visual observation and field screening measurements, to ensure safe handling and to provide information for segregation and packaging. The initial characterization for the individual waste types is summarized in Table 6.1. Excavated soil will be segregated and packaged for off-site disposal or transferred to the soil stockpile area inside the temporary structure for reuse as backfill. Drums will be packaged and transferred to the SIP to evaluate and manage the drum contents. Debris will be packaged and transported to the Waste Package Staging Area outside of the structure and managed for off-site disposal (Figure 2-1). Procedures and steps for performing the excavation tasks are outlined in *IWCP No. T0095380, Excavate Trench 1, IHSS 108.*

The excavation will be limited to the contents of the trench and any contaminated soil encountered to the depth of highly weathered bedrock, one to three feet below the alluvial/bedrock contact, or to the depth of groundwater, if encountered. Unweathered bedrock will not be excavated. Prior to backfilling, excavation boundary sampling will be performed as described in Section 6.7. The open excavation will be inspected periodically until the excavation is backfilled during site reclamation activities (see Section 6.16).

When the excavation is inactive and unattended during periods of extended downtime or between work shifts, any exposed drums and waste material in the trench will be covered with soil, using the excavator bucket, to remove oxygen that might react with potentially pyrophoric depleted uranium contained in the drums or on the waste materials.

The HASP (RMRS, 1998b) outlines the personal exposure and environmental monitoring that will be conducted during the excavation, material handling, and soil stockpiling activities. Decontamination and radiological surveying of excavation equipment and personnel will be performed according to the procedures outlined in Section 7.0 of the HASP.

Table 6.1
Initial Waste Characterization Summary

Waste Type	Initial Characterization Type/Instrument[1,2,3]
Drums (intact)	• Heat testing - Newport Model OS521 Handheld Infrared Thermometer • Radiation Survey - Eberline Model RO-20 Beta/Gamma Radiation Detector • Combustible gases - Mine Safety Appliances Model Passport • VOCs - Foxboro Model TVA 1000 PID/FID • Radiological contamination survey of accessible surfaces - NE Technology Model Electra or Ludlum Model 31 with 44-9 Probe and Ludlum Model 12-1A • pH of any liquids present
Drums (non-intact)	• Heat testing - Newport Model OS521 Handheld Infrared Thermometer • Radiation Survey - Eberline Model RO-20 Beta/Gamma Radiation Detector • Combustible gases if voids are present - Mine Safety Appliances Model Passport • VOCs - Foxboro Model TVA 1000 PID/FID • Radiological contamination survey of accessible surfaces - NE Technology Model Electra or Ludlum Model 31 with 44-9 Probe and Ludlum Model 12-1A • pH of any liquids present
Soil	• Low Energy Gamma Radiation Screening - Bicron FIDLER • VOCs - Foxboro Model TVA 1000 PID/FID
Debris	• Radiation Survey - Eberline Model RO-20 Beta/Gamma Radiation Detector • Combustible gases if voids are present - Mine Safety Appliances Model Passport • VOCs - Foxboro Model TVA 1000 PID/FID • Representative radiological contamination survey of accessible surfaces - NE Technology Model Electra or Ludlum Model 31 with 44-9 Probe and Ludlum Model 12-1A
Unknown Material or Containers and Suspected Classified Items	• Heat testing - Newport Model OS521 Handheld Infrared Thermometer • Radiation Survey - Eberline Model RO-20 Beta/Gamma Radiation Detector • Combustible gases if voids are present - Mine Safety Appliances Model Passport • VOCs - Foxboro Model TVA 1000 PID/FID • Radiological contamination survey of accessible surfaces - NE Technology Model Electra or Ludlum Model 31 with 44-9 Probe and Ludlum Model 12-1A • pH of any liquids present

[1]Instruments are those anticipated to be used. Equivalent instruments may be substituted after approval from radiological Engineering or Industrial Hygiene.
[2]Initial characterization will be performed in the order shown.
[3]Action levels for individual instrument readings and the action to be taken can be found in Section 7.0 of the HASP (RMRS, 1998b).

6.1.1 Excavation of Soil

The excavated soil will be raised in the excavator bucket and the bucket will be placed on the ground. Soil in the bucket will be screened for levels of radiological and VOC contamination as shown in Table 6.1, and segregated based on the screening results (see Section 6.2.1).

6.1.2 Excavation of Drums

All intact drums encountered in the trench will be removed from the trench individually (one drum at a time), in order to minimize exposure to workers, the environment, and the public. The drums will be exposed one row at a time, so that the maximum number of drums exposed at any one time will be 12, assuming the drums are stacked two high in rows of six drums across (as indicated by information obtained from former Rocky Flats employees associated with burial of wastes in Trench 1). The 12 drums will include the number of drums uncovered inside the trench plus the number of drums being managed adjacent to the trench excavation. Although 12 drums may be exposed at the excavation area at one time, as many as six previously buried drums may be outside of the excavation area at one time for sampling and inerting process activities at the SIP. A detailed evaluation of these bounding conditions is provided in the *Safety Analysis for Individual Hazardous Substance Site (IHSS) 108, Trench 1 (T-1) Source Removal Project* (RMRS, 1998d).

Prior to removal from the trench, each intact drum will be vented with the excavator bucket to release any potentially explosive gas build-up inside the drum (i.e., hydrogen). A drum piercing device shall be used with the excavator bucket to pierce the drum lid. The device will be made of non-sparking material to minimize spark-potential and will be designed to ensure that both 55-gallon drums and 30-gallon drums, if drums are overpacked, are pierced. The device will be designed such that it will produce a hole in the drum lid(s) large enough to visually inspect, monitor, and sample the drum contents. All drum venting activities will be performed inside the trench.

After each intact drum has been vented, it will be lifted using the excavator bucket and placed adjacent to the trench within a shallow containment pan for initial characterization. Initial characterization will include: heat testing, radiation surveying, combustible gas monitoring, and VOC screening (Table 6.1). The containment pan will minimize spread of contamination and contain potential spill of liquids. The drum and/or contents will be heat-tested using a handheld infrared thermometer to measure the temperature of the drum contents and detect potential temperature increases in the drum resulting from oxidation of pyrophoric depleted uranium chips/turnings. Appropriate fire controls will be used on the drum if the heat test is positive. Procedures for performing the heat test and actions to be taken if elevated temperatures are detected are described in the ER *Operations Order OO-T1-09, Temperature Measurements of Depleted Uranium Using Infrared Heat Gun.*

If the heat test results indicate it is safe to do so, a radiation dose survey will be performed using a beta/gamma radiation detector. If the radiation survey determines that the drummed material has a gamma or beta exposure rate of greater than 100 millirem per hour (mrem/hr) at 30 centimeters, work will temporarily stop to evaluate hazards and controls and the work area will be posted as "High Radiation Area". The drum will then be field screened for radiological contamination, VOCs, and combustible gases using the instrumentation listed in Table 6.1. If the initial characterization indicates that the drum can be safely handled, the drum will be placed into a Department of Transportation (DOT) 7A Type A overpack drum. The overpacked drum will be transferred via forklift to the SIP for further evaluation by the subcontractor (see Section 6.4). The field screening results for each drum will be recorded and provided to the subcontractor upon transfer.

If the drums are not intact, approximately one to two cubic yards of drum fragments and drum contents commingled with surrounding soil will be removed from the trench and placed directly into a DOT 7A Type A metal box. This material will undergo the same initial characterization as for intact drums and segregated as described in Section 6.2.2, Segregation and Packaging of Drums.

In addition to the drums containing depleted uranium, historical drum inventory lists for Trench 1 indicate that one 55-gallon drum containing "still bottoms" and ten 55-gallon drums of cemented cyanide waste, originating from Building 444, were buried in the trench. Based on historical records and Building 444 process knowledge, the "still bottoms" could potentially consist of either lathe coolant oil sludge or residual trichloroethene and perchloroethene waste solvents and sludge generated from machined parts cleaning. If encountered, the drums containing "still bottoms" and cemented cyanide will be repackaged in a drum overpack, or equivalent package, and transferred to the SIP for evaluation, sampling, and management (Section 6.4.4).

Interviews with former site workers indicate that the eastern portion of Trench 1 is likely to contain trash and debris, including empty or crushed drums. Empty drums and crushed drums, if encountered, will be removed from the trench using the excavator bucket and initially characterized adjacent to the trench while inside the bucket. The drums will then be segregated and packaged as described in Section 6.2.3, Segregation and Packaging of Debris. If necessary, the drums may be returned to the trench and size-reduced in the trench using the excavator bucket. The size-reduced empty drums will then be removed from the trench and segregated and packaged as described in Section 6.2.3.

6.1.3 Excavation of Debris

Miscellaneous debris and trash excavated from the trench is expected to include compatible materials such as personal protective equipment, wood, metal, rubber, plastics, paper, and glass. Immediately following removal from the trench and while still in the excavator bucket, these items will be visually inspected for stains or discolorations and initially characterized as shown in Table 6.1.

6.1.4 Excavation of Unknown Materials and Containers

Materials or containers which cannot be immediately identified will be inspected for labels, markings, or other information and initially characterized as shown in Table 6.1. If it can be done safely, the material or container will then be appropriately packaged and transferred to the SIP for further evaluation.

If the unknown material presents an "Unanticipated Hazard or Condition", the material will be managed in accordance with RMRS policy statement: Directive-001. Possible "Unanticipated Hazards or Conditions" and the corresponding response actions that should be followed are outlined in Section 7.7 of the HASP.

6.1.5 Excavation of Suspected Classified Items

An item suspected of being "classified" will be initially characterized per Table 6.1. The item will be isolated and the RFETS Classification Office will be contacted to determine if the item is classified. If classified, the item will be secured and the final disposition will be determined by the Classification Office.

6.2 SEGREGATION AND PACKAGING OF SOIL, DRUMS, DEBRIS, UNKNOWN MATERIALS, AND SUSPECTED CLASSIFIED ITEMS

Drums, soil, debris, unidentifiable material, and suspected classified items will be segregated and packaged according to identifiable waste types and the results of initial field characterization. To the extent possible, all material removed from the trench will be segregated and packaged adjacent to the trench using the excavator bucket. Waste packaging will be conducted in accordance with ER *Operations Order OO-T1-07, Packaging of Trench 1 Waste.*

6.2.1 Segregation and Packaging of Soil

Depending on the results of the initial characterization, excavated soil will be segregated and placed directly into waste packages or transferred to the soil stockpile area. Table 6.2 summarizes the soil screening decision levels and soil segregation methodology to be used. The excavated soil will be radiologically screened using a Field Instrument for the Detection of Low-Energy Radiation (FIDLER) per the RFETS Radiological Operating Instructions and the SAP (RMRS, 1998c). An organic vapor analyzer (OVA), or similar instrument, with a flame-ionization detector (FID) and photo-ionization detector (PID) will be used to screen for VOC contamination.

Table 6.2
Soil Segregation Methodology

FIDLER Readings (cpm)[1]	VOC Readings Above Background Measurements (ppm)[2]	Depleted Uranium Content	Method of Soil Segregation
< 5,000	< 25	No depleted uranium	Transfer to soil stockpile
≥ 5,000 and ≤ 10,000	< 25	No depleted uranium	Package or transfer to soil stockpile. Stockpile separate from < 5,000 cpm soil.
> 10,000	< 25	No depleted uranium	Package as low-level waste
NA	NA	Contains depleted uranium	Package and transfer to the SIP
NA	≥ 25	No depleted uranium	Package as mixed/low-level waste

[1] cpm - counts per minute
[2] ppm - parts per million
NA - Not Applicable

All soils excavated from the trench will be sampled for compliance with RFCA Tier I radionuclide and VOC action levels. VOC-contaminated soil above Tier I action levels will be staged for future treatment and disposal. Soil within this category is expected to be associated with a drum(s) containing still bottoms and is not anticipated to be a major waste volume generated during the Trench 1 project.

Off-site treatment capacity is currently not available for soil with significant VOC contamination (e.g., in excess of RFCA and RCRA Land Disposal Restriction treatment standards (6 CCR1007-3, Section268.40)) which is also radiologically contaminated. In accordance with the PAM (RMRS, 1998a), soil in this category may be stored onsite pending availability of future off-site treatment, or, if sufficient VOC-contaminated soils are present, may be treated using onsite processing (e.g., low-temperature thermal desorption).

Radiologically contaminated soil below RFCA Tier I and greater than Tier II levels will be disposed of off-site or returned to the trench within a geotextile fabric. The geotextile fabric will allow for future retrieval of the soil if required. If encountered, soil commingled with potentially pyrophoric depleted uranium material will be packaged adjacent to the trench and transferred to the SIP for further analysis, sampling, and stabilization as described in Section 6.4. If the soil commingled with depleted uranium is VOC-contaminated above contained-in and RFCA Tier I action levels, it will be packaged as mixed/low-level waste and stored onsite in a Temporary Unit pending availability of future off-site treatment.

The screening level of 5,000 cpm on the FIDLER has been set as a conservative break point for soils and should contain DOE radionuclides at concentrations below the RFCA Tier II action levels. The 5,000 cpm decision level was set based on:

- process knowledge of the FIDLER and its response to DOE radionuclides; and
- past experience with RFETS soils contaminated with depleted uranium.

This screening level will be re-evaluated during the excavation activities by comparing the screening level to the observed radiological analytical results for the segregated soils. Based on this comparison and, if necessary, the screening level will be adjusted accordingly. The 10,000 cpm and the 25 ppm action levels have been selected based on best available information and will be further evaluated and adjusted accordingly with analytical data gathered in the field.

6.2.2 Segregation and Packaging of Drums

Intact drums containing depleted uranium, still bottoms, cemented cyanide, and unknown material will be removed from the trench, initially characterized, and placed in an overpack drum or other approved waste package. The intact drum will be hoisted with a drum harness or drum grabber designed for placing drums into overpacks. The waste package will then be transferred to the SIP via forklift where the drum contents will be further characterized, sampled, and segregated by SIP personnel. A Lifting Plan and a hoisting and rigging checklist will be completed per *HSP-12.02, Hoisting and Rigging* for the overpacking of intact drums. The Lifting Plan and hoisting and rigging checklist are provided in Appendix D of the HASP (RMRS, 1998b).

Drums containing depleted uranium material will be placed in certified DOT 7A Type A, 83-gallon overpack drums and will be stabilized by inerting with mineral oil (see Section 6.4.2). The drums will be sampled according to Starmet's approved sampling and analysis plan (Starmet, 1998c). The drums will be appropriately packaged for off-site shipment and transferred to the Waste Package Staging Area located outside of the temporary structure. Prior to shipment, the 83-gallon overpack drums containing depleted uranium material will be placed in DOT 7A Type A, 110-gallon drums to meet DOT requirements for shipping pyrophoric materials (49 CFR 173.418).

Cemented cyanide and still bottom wastes will be sampled for waste characterization, appropriately packaged, and staged at the Waste Package Staging Area. Upon receipt of analytical results, cemented cyanide and still bottom wastes will be managed for appropriate treatment and/or disposal. If encountered, other liquids and sludges in drums will be re-packaged, if necessary, and sampled for characterization and appropriate disposition. Debris in drums will be handled as described in Section 6.2.3.

Non-intact drums and associated soil will be removed from the trench, initially characterized, and segregated based on the initial characterization. The initial characterization will be conducted while the material is still in the excavator bucket so that depleted uranium and non-depleted uranium containing waste streams are not placed in the same waste package. Non-intact drums and

associated soil will be placed in certified DOT 7A Type A metal boxes (B-12 boxes). As the waste package is being filled, personnel may remove coarse debris and/or drum fragments which will be surveyed and placed in a separate waste package designated for debris.

Packages containing or suspected of containing depleted uranium material will be transferred to the SIP where they will be sampled according to the Starmet's sampling and analysis plan (Starmet, 1998c) and stabilized by inerting with dry soil. The packages will be transferred to the Waste Package Staging Area. Packages which do not contain depleted uranium will be sampled adjacent to or near the trench prior to being transferred to the Waste Package Staging Area.

6.2.3 Segregation and Packaging of Debris

Debris and trash excavated from the trench may include materials such as spent personal protective equipment, empty or crushed drums and other metal, wood, rubber, plastic, paper, and glass. Materials removed from the trench will be visually inspected for stains or discolorations, indicating potential chemical contamination, and surveyed and screened for radiological and VOC contamination, respectively, as shown in Table 6.1. The materials will be segregated and packaged adjacent to the excavation based on like waste forms and results of the initial characterization.

If the radiation survey determines that the materials have a gamma or beta exposure rate of 100 mrem/hr at 30 centimeters, work will pause for further evaluation and the work area will be posted as "High Radiation Area". If the initial characterization of the debris indicates the presence of VOCs or it is suspected to be chemically contaminated, it will be placed in a waste package adjacent to the trench designated for mixed/low-level waste. If chemical contamination is not detected or suspected, the debris will be handled as low-level waste and packaged accordingly. The debris waste packages will be sampled in accordance with the SAP (RMRS, 1998c) and transferred to the Waste Package Staging Area.

All debris will be visually verified to be free of depleted uranium chips and turnings. Debris with visual evidence of depleted uranium will be manually cleaned to remove the chips and turnings (e.g., brushing turnings from debris). Debris which cannot be cleaned of the chips/turnings will be sampled, packaged, and managed at the SIP with other potentially pyrophoric materials.

Size reduction of large debris items, if required for packaging, will be conducted only after the initial characterization and identification of potential hazards. Common debris such as wood, metal, rubber, plastic, and glass may be size-reduced with the excavator bucket either inside the trench or as it is placed into the waste package. Empty drum carcasses which do not contain liquids or depleted uranium chips or oxide, may be reduced with the excavator bucket in the trench. Drums or drum fragments which previously contained liquids and do not contain depleted uranium chips or oxide, may be reduced with the excavator bucket in the trench. Drums containing or suspected of containing depleted uranium chips or oxide will not be sized-reduced.

6.2.4 Segregation and Packaging of Unknown Materials and Containers

Materials or containers which cannot be immediately identified will be initially characterized as shown in Table 6.1 and transferred to the SIP for further analysis, sampling, stabilization if necessary, and packaging. Any containers with liquids or sludges will be inspected for labels, markings, or other identifying information. The container will be screened for radiological and VOC contamination as well as combustible gases. The container will be re-packaged to ensure container contents remain controlled during transport to the SIP.

If the unknown material presents an "Unanticipated Hazard or Condition", the material will be managed in accordance with RMRS policy statement: Directive-001. Possible "Unanticipated Hazards or Conditions" and the corresponding response actions that should be followed are outlined in Section 7.7 of the HASP (RMRS, 1998b).

6.2.5 Segregation and Packaging of Suspected Classified Items

An item suspected of being "classified" will be initially characterized as summarized in Table 6.1 to ensure the item can be safely handled. The item will be isolated and the RFETS Classification Office will be contacted to determine if the item is classified and to remove it if necessary.

6.3 TRANSPORT OF MATERIAL TO THE SAMPLING AND INERTING PAD (SIP)

Transport of drums, soils containing depleted uranium chips/turnings, or unknown materials to the SIP will be done using a forklift. The forklift will travel on established roadways within the temporary structure. Dust suppression on the roadways will be performed with potable water spray to limit the generation of airborne dust.

The outer sides of the soil packages will be visibly inspected by site personnel and brushed clean of any loose material before being transferred. All soil packages will be sealed, labeled, and decontaminated as appropriate inside the structure. The filled packages will be moved to a radiological survey area where they will be surveyed out of the HCA per the *RFETS Radiological Control Manual* (K-H, 1996).

6.4 SAMPLING AND INERTING PAD (SIP) OPERATIONS

SIP operations will include receiving, sampling and packaging, and stabilization of depleted uranium-containing waste packages to be shipped for off-site treatment; and receiving, sampling, and packaging of other waste materials. Waste material stabilization will involve inerting the potentially pyrophoric depleted uranium material to render it suitable for off-site shipment compliant with Department of Transportation 49 CFR 173.418 for pyrophoric Class 7 (radioactive) materials. Operations within the SIP will be conducted by Starmet personnel in accordance with the Trench 1 Project HASP (RMRS, 1998b).

Materials received at the SIP may include depleted uranium chips and turnings, depleted uranium chips and turnings commingled with soil, suspected cemented cyanide, suspected still bottoms, suspected classified items, debris, and unknown wastes. It is anticipated that most material will arrive at the SIP in overpacked intact drums, overpacked non-intact drums, and sealable steel packages. Upon arrival at the SIP, all waste packages will be visually inspected and inventoried by the subcontractor. The waste packages will be weighed as they arrive at the SIP to document the amount of waste material received by the subcontractor (Starmet). The packages will also be weighed following inerting operations to ensure that the maximum payload weight of the waste packages is not exceeded and to document the package weights for shipment manifests.

6.4.1 Characterization of Material Received at the SIP

Initial characterization of the materials will have been performed at the time of removal from the trench. The initial characterization information will be used to determine the sampling, inerting, and packaging methods that will be applied to the materials at the SIP. If necessary, additional measurements will be taken using direct-reading instruments to provide additional information to SIP personnel. It is anticipated that most materials will have been identified prior to transferring the materials to the SIP. The initial characterization results will be communicated to SIP personnel via the waste package specific Checklist for Packaging Trench 1 Waste included in the ER *Operations Order No. 00-T1-07, Packaging of Trench T-1 Waste.*

6.4.2 Sampling and Inerting Depleted Uranium Chips and Turnings in Intact Drums

Historical records and information obtained through employee interviews indicate that as many as 125, 30-gallon and 55-gallon steel drums containing 10,000 to 20,000 kilograms of depleted uranium chips and turnings were buried in Trench 1. The chips and turnings were reportedly coated with a water-soluble lathe coolant (trade name Cimcool) during machining of parts. Several of the drums containing depleted uranium and lathe coolant are described as 30-gallon drums placed inside 55-gallon drums and then overpacked with graphite.

Each intact drum received at the SIP will be visually inspected to determine if the drum contains free liquids (Cimcool), and whether or not depleted uranium chips and turnings are visible in the drum. If liquids are present, SIP personnel will obtain a sample of the liquids for characterization in accordance with the Starmet sampling and analysis plan (Starmet, 1998c). The liquids will then be pumped out of the drum into a new drum or other appropriate package. If appropriate, bulk sampling of liquids in the package may be performed. Although most liquids encountered in intact drums are expected to be Cimcool and will be packaged together, the following precautionary measures will be taken to determine compatibility of liquids before being mixed together:

- pH will be measured. In general, liquids with a pH of 5 to 9 may be mixed together. If necessary, separate containers will be used for liquids exhibiting pH less than 5 and greater than 9.

- VOC concentration will be measured. As a good waste management practice, liquids exhibiting high VOC readings will not be mixed with liquids exhibiting low VOC readings.

- Visual inspection will be performed. SIP personnel will evaluate compatibility based on appearance including such characteristics as color, viscosity, and odor. Liquids with differing characteristics will be containerized separately.

Once the liquids have been removed from the drum, a sample of the drum contents will be collected either before or after inerting and any turnings that are visible may be compressed with a long-handled non-sparking tool. Mineral oil will then be added to the drum to cover the drum contents. The depleted uranium material will be covered to at least six inches above the level of the material with mineral oil to render the material inert, in accordance with DOT requirements for shipping pyrophoric materials (49 CFR 173.418). The inerted drum (inner drum) will be braced in position inside the overpack drum by inserting wooden blocks in the annulus. The annulus will then be filled with mineral oil to the same level as in the inner drum. The overpack drum will be sealed with a vented lid, appropriately labeled, and staged for transport from the SIP to the east end of the temporary structure.

Prior to inerting, temperature measurements of the drum contents will be obtained to verify that the depleted uranium chips and turnings are not undergoing rapid thermal oxidation that could ignite the mineral oil during inerting. Procedures for performing the temperature measurements and actions to be taken if elevated temperatures are detected are described in the ER *Operations Order OO-T1-09, Temperature Measurements of Depleted Uranium Using Infrared Heat Gun.*

All liquid wastes, including Cimcool coolant, removed from drums will be packaged by SIP personnel and returned to RMRS for disposition. The liquid wastes will be transferred to the Waste Package Staging Area outside the temporary structure and temporarily stored until sample analytical results are received and evaluated. Waste Cimcool may be treated at RFETS in Building 374, or may be shipped off-site for appropriate treatment and/or disposition. Other liquid wastes, if any, will be dispositioned accordingly, based on characterization data.

6.4.3 Sampling and Inerting Depleted Uranium Chips and Turnings in Non-Intact Drums

If drums originally containing depleted uranium material are not intact when excavated, the expected mix of depleted uranium, soil, and drum fragments will be placed directly into a DOT 7A Type A metal box at the excavation and transferred to the SIP. Large pieces of drum fragments or other solid wastes that are not contaminated with depleted uranium, or may have the depleted uranium easily removed, may be removed from the waste package and segregated for appropriate disposal. A representative sample of the package contents will be collected as specified in the subcontractor's sampling and analysis plan (Starmet, 1998c). Dry soil will be added to the package to fill the package and inert the potentially pyrophoric contents. The soil is added to occupy the void space above the surface of the material to exclude available oxygen that might react with potentially pyrophoric depleted uranium. The package will then be sealed, labeled, and staged for transport from the SIP to the east end of the structure.

The above mentioned DOT 7A Type A overpack drums and metal boxes will be fitted with a pressure vent (NFT model No. 013 or equivalent) to relieve possible minor quantities of hydrogen gas generated in the packages during shipment to the Starmet South Carolina treatment facility. Both methods of inerting and packaging described above are compliant with DOT 49 CFR 173.418.

6.4.4 Sampling Cemented Cyanide and Still Bottom Wastes

Intact drums containing still bottoms will be initially screened at the time of removal from the trench, placed into overpack drums, and transferred to the SIP. SIP personnel will visually inspect the drum contents and collect samples per the subcontractor's sampling and analysis plan (Starmet, 1998c). Liquids and sludges encountered in intact drums may be segregated from solids, if necessary, and sampled for waste characterization. Free liquids will be pumped into an appropriate package and returned to RMRS. The drum will be sealed and, if necessary, braced in position inside the overpack drum. The overpack drum will be sealed and labeled, and staged for transport from the SIP to the east end of the temporary structure.

Cemented cyanide wastes will be re-packaged, if necessary, and sampled in accordance with the subcontractor's sampling and analysis plan (Starmet, 1998c). Sampling results will be used to verify the material waste type and characterize the waste for applicable disposal and treatment options (if required). RMRS will manage the treatment and/or disposal of cemented cyanide waste and still bottoms, based on the characterization results.

6.4.5 Suspected Classified Items, Debris, Unknown Wastes

If encountered, suspected classified items will be segregated from drum materials and held for inspection by the RFETS Classification Office. Large pieces of debris, not containing depleted uranium, lying on or protruding from the surface of material in packages will be removed,

consolidated in a package, and returned to RMRS. To minimize the potential for airborne dispersion of radiological contamination and personal injury, intrusive retrieval of debris from materials will not be performed at the SIP. The systematic separation of debris from packages received at the SIP will be performed during treatment operations at the Starmet South Carolina facility.

Unknown materials or containers received at the SIP will be evaluated and sampled per the subcontractor's sampling and analysis plan (Starmet, 1998c). Non-depleted uranium materials will be appropriately packaged for treatment or disposal by SIP personnel and returned to RMRS. Unknown materials contaminated with potentially pyrophoric material will be inerted and packaged for off-site treatment.

All waste packaging in the SIP will be conducted under the supervision of an RMRS representative in accordance with ER *Operations Order No. OO-T1-07, Packaging of Trench 1 Waste*. Waste packages will be approved by RMRS prior to use to assure compliance with RFETS policies, DOT, and selected disposal facility requirements.

All waste packages will be sealed and decontaminated prior to being released from the SIP. The exterior of the packages will be decontaminated using dry decontamination methods (e.g., brushing, wiping). All overpack drums and metal boxes will be externally cleaned of gross contamination immediately following inerting at the SIP. Radiological screening and surveying will be conducted by Radiological Operations personnel on the package exteriors to achieve applicable release limits specified by the *RFETS Radiological Control Manual* (K-H, 1996). Screening and surveying results will be documented on controlled logsheets. Final decontamination of waste packages will be performed at the SIP or in a staging area inside the temporary structure. See Section 6.6 for a description of final waste package management.

6.5 MANAGEMENT OF THE SOIL STOCKPILE AREA

As described in Section 6.2.1, soil excavated from Trench 1 with less than or equal to 10,000 cpm with the FIDLER and VOCs detected less than 25 ppm above background measurements on the OVA will be placed in the soil stockpile area for storage until final disposition is determined. Separate stockpiles will be established for soil with 1) less than 5,000 cpm (measured with the FIDLER) and 2) soil with greater than or equal to 5,000 cpm and less than or equal to 10,000 cpm radioactivity. Jersey barriers will be installed to bound the stockpile area and separate and contain the two soil stockpiles.

The soil will be transferred from the excavation to the soil stockpiles using a front-end loader. To ensure safe movement of the front-end loader, a roadway will be established between the excavation site and the stockpile area using barriers, ropes, and/or hazard tape as necessary. The front-end loader will dump loads of soil at the soil stockpiles in a manner which will limit the generation of dust. If necessary, dust suppression with clean water will be performed to limit the generation of airborne dust.

The stockpiled soils will be sampled as specified in the SAP (RMRS, 1998c) for comparison with RFCA Tier I action levels for radionuclides and VOCs. Soil with radionuclide contamination below the RFCA Tier II action levels will be returned to the trench. Radiologically contaminated soil below Tier I and greater that Tier II action levels will be disposed of off-site or returned to the trench within a geotextile fabric (to allow for future retrieval of the soil if required). If present, VOC-contaminated soil above Tier I action levels will be staged for future treatment, if necessary, and disposal.

After all soil has been removed from the stockpile area, the surface soil beneath the area will be radiologically surveyed and the area released in accordance with Radiological Engineering and Radiological Operations guidance. Any contaminated soil beneath the stockpile area will be removed by a front-end loader or equivalent and managed for appropriate disposal, if required.

6.6 MANAGEMENT OF WASTE PACKAGES

With the exception of soil in the soil stockpile used to backfill the trench (based on analytical results), all waste streams generated during this project will be packaged for treatment or disposal. The waste streams identified may include the following:

- depleted uranium material inerted with mineral oil and depleted uranium material inerted with soil;
- liquid wastes, such as still bottoms and Cimcool;
- contaminated soil;
- debris including drum carcasses, wood, paper, metal, trash;
- used PPE;
- decontamination waste water and incidental waste water;
- miscellaneous hazardous waste, such as cemented cyanide; and
- sanitary waste.

After waste packages originating from either the SIP or outside of the SIP have been decontaminated, sealed, and labeled, they will be transferred via forklift to the southeast corner of the temporary structure where they will be surveyed for unrestricted release. Once outside of the temporary structure, the packages containing depleted uranium waste (DOT 7A Type A overpack drums and B-12 metal boxes) will be appropriately labeled for off-site shipment per the ER *Operations Order No. OO-T1-07, Packaging of Trench 1 Waste.* Packages containing depleted uranium waste will be covered and temporarily staged in the Waste Package Staging Area until a complete truckload is available for off-site shipment. The packages will be loaded into 45-foot closed vans, or other appropriate transport, for shipment to the Starmet Corporation treatment facility in Barnwell, South Carolina. Transport to the Starmet treatment facility will be performed

by a designated, qualified and pre-approved common carrier. RMRS will prepare a detailed data package for each shipment. DCI will prepare appropriate shipping paperwork and manifests based on the data packages.

Prior to shipment to the Starmet treatment facility, the 83-gallon overpack drums containing depleted uranium waste will be placed into (certified DOT 7A Type A) 110-gallon overpack drums. The 83-gallon inner drums will be braced in position inside the 110-gallon drums using wooden blocks in the annulus. The 110-gallon overpack drums will be sealed with a vented lid and appropriately labeled for shipment. The weight of the 110-gallon drum and materials used for bracing will be added to the measured weight of each 83-gallon package. This total package weight will be documented on the shipment manifests.

All other waste packages will be staged within the Waste Package Staging Area according to the waste type they contain (i.e., low-level, mixed/low-level, or RCRA hazardous). The waste staging areas will be posted with respect to radiation levels based on the waste package radiation survey results. Specific waste package staging areas are summarized in Table 6.3.

Table 6.3
Waste Package Staging Area Summary

Waste Type	Staging Area Type
Low-level waste	Radioactive Material Area (RMA)
Mixed/Low-level waste	Temporary Unit with RMA Posting
RCRA hazardous waste	Temporary Unit

6.7 EXCAVATION VERIFICATION SAMPLING

At the completion of excavation operations, verification soil samples will be collected along the base and sides of the excavation to determine the post-action condition of the subsurface soils. Verification samples will be collected and analyzed according to the procedures and requirements stated in the SAP (RMRS, 1998c). The sampling will be performed after a nominal six-inch scrape below the drums and debris to clear the trench bottom of any residual waste material. Visible staining which may extend beneath the trench bottom will also be removed prior to collecting samples. If sample analytical results indicate that contamination is present above cleanup target levels, further excavation and sampling will continue until cleanup target levels are achieved, or one of the limiting conditions discussed below are met.

If contamination is encountered below the bottom of the trench, the excavation will be limited to the highly weathered bedrock, one to three feet below the alluvial/bedrock contact, or to the depth of

groundwater, if encountered. Unweathered bedrock will not be excavated. An OVA with FID and/or PID detectors and a FIDLER will be used as field screening tools to guide the excavation activities before collection of the excavation verification samples.

6.8 MANAGEMENT OF INCIDENTAL WATER

Incidental water encountered as a result of potential groundwater entering and collecting in the excavation will be removed from the excavation if sufficient volume is present to impact operations, and transferred to a temporary storage container near the excavation. Before excavation, groundwater levels from the nearby monitoring wells will be measured to establish the depth to the unconfined water table.

Surface water run-on into the excavation area is not anticipated since the Trench 1 site will be covered by the temporary structure. The ground surface adjacent to the perimeter of the structure will be sloped to ensure that water shed by the structure flows away from the site. Likewise, no surface water run-off from the excavation area is expected. Even so, routine surface water monitoring will be performed during excavation activities using the existing RFCA automated surface water monitoring stations located near Trench 1 (i.e., Station SW022 located immediatley downstream of the site in Central Avenue Ditch and Station GS10 located downstream in South Walnut Creek).

Incidental water collected from the excavation or from within bermed areas, if any, will be sampled as specified in the SAP (RMRS, 1998c) and treated in the Consolidated Water Treatment Facility (CWTF) located in Building 891 or in the Building 374 Waste Treatment Facility. Following treatment, the water will be sampled and released in accordance with discharge criteria.

6.9 MANAGEMENT OF SANITARY WASTE

All sanitary waste will be managed in accordance with the *RFETS Sanitary Waste Off-Site Disposal Manual, 1-MAN-011-SWODM* and the *Sanitary Waste Off-Site Procedures, 1-PRO-573-SWODP.*

6.10 AIR MONITORING

WORKER PROTECTION

Radiological high volume and low volume air sampling for particulate radionuclides will be performed within the temporary structure during periods of soil movement or other dust generating activities per the *As Low as Reasonably Achievable (ALARA) Job Review for Individual Hazardous Substance Site (IHSS) 108 Trench 1 (T-1) Source Removal Project* (RMRS, 1998e). Continuous air monitors (CAMs) will be located within the structure vestibules (CAs). The CAMs will serve to alert potentially exposed individuals to unexpected increases in airborne radioactivity levels (Figure 2-2). Response to CAM alarms will be in accordance with *RSP-4.01, Continuous Air Monitor - Use.*

Real-time industrial hygiene air monitoring will be conducted inside the temporary structure to characterize potential personnel exposures and to ensure that airborne concentrations are below levels which are Immediately Dangerous to Life and Health (IDLH). Monitoring will be conducted for VOCs, carbon monoxide, nitrogen dioxide, particulates, and sulfur dioxide.

In addition to real-time monitoring, personal integrated air sampling will be conducted, at the discretion of the Site Safety Officer, at the excavation and soil stockpile area for dust, VOCs, metals, cyanide, and diesel emission gases. Job functions inside the temporary structure will be observed in order to sample the highest risk employees.

Wind speed and direction outside of the temporary structure will be monitored during work evolutions. Monitoring will be performed in accordance with applicable RFETS procedures and the HASP (RMRS, 1998b). During soil handling activities, dust minimization techniques such as water sprays may be used inside the structure to control suspension of particulates. Dust suppression may be performed using a potable water spray or mist on the soil as it is excavated.

AIR QUALITY

The Kaiser-Hill Air Quality Management group maintains the RFETS Radioactive Ambient Air Monitoring Program (RAAMP) which monitors the perimeter of RFETS continuously with samples collected and analyzed on a monthly basis. The RAAMP sampling network also includes monitoring stations inside the perimeter of RFETS which are collected but not analyzed unless conditions warrant additional analysis.

An enhanced, project-specific environmental air monitoring program will be implemented during soil and debris handling activities. The project-specific ambient air sampling program will consist of enhanced monitoring at four existing RAAMP samplers located in the immediate vicinity of Trench 1, and three high-volume samplers located within the structure near those activities that have the greatest potential to release radionuclides into the ambient air. This enhanced monitoring will be based on scheduled project activities. Samples from each monitor will be collected and analyzed on a weekly basis. Sample collection from the monitors located within the structure will be conducted in accordance with ER *Operations Order No. OO-T1-08, Ambient Air Monitoring*

Within the Temporary Structure. Sample collection from the four project-specific RAAMP monitors will be conducted in accordance with the *K-H Air Quality Procedure, 4-536-ENV-AQ.13, Radioactive Ambient Air Monitoring.*

If a radionuclide release is suspected based on project information or the enhanced sampling results, then an event sampling program will be implemented. Event sampling may include, but is not limited to, expedited sample analyses and evaluation, additional sampling and analyses at various locations, and/or more frequent sampling at various locations. The Trench 1 air monitoring program is described in detail in the *Trench 1 Source Removal Air Monitoring Plan* (K-H, 1998).

The purpose of the enhanced, project specific environmental air monitoring program is to provide ambient air and project emissions data necessary to determine, and manage, compliance with the public dose standard of Title 40 of the Code of Federal Regulations (CFR), Part 61.93, which has been determined to be protective of public health.

6.11 FIRE CONTROL AND FIRE SUPPRESSION

In the event of a depleted uranium fire, fire control and fire extinguishment will be conducted in accordance with the *Fire and Emergency Services General Operating Guideline 3-FES-GOG-229, Pyrophoric Metals Fire Extinguishment.* Appropriate fire control and fire suppression agents (e.g., sodium chloride-based powder [MET-L-X], dry magnesium oxide powder) will be located immediately adjacent to the excavation site, and at locations where potentially pyrophoric depleted uranium material is handled and managed (i.e., the SIP). Trench 1 field personnel, designated by Project Management, will be trained by the RFETS Fire Department in using dry chemical and MET-L-X pyrophoric metals fire extinguishing techniques. The RFETS Fire Department will be notified immediately of any fire or other potential hazardous condition at the site.

To minimize fire hazard, all depleted uranium and associated materials removed from the trench will be containerized and covered during transport from the trench to the SIP. General fire prevention measures and fire prevention inspections for the temporary structure and project field trailers are described in Section 8.0 of the HASP (RMRS, 1998b).

6.12 TRAFFIC CONTROL

Heavy Equipment traffic controls inside of the temporary structure will include roadways established for the heavy equipment, and placing jersey barriers around regularly occupied work areas. Roadways will be established between the excavation site and the soil stockpile area for movement of the front-end loader and from the excavation site to the SIP for transferring waste packages with the forklift truck. Personnel working near active roadways inside the structure will be required to wear orange vests.

Vehicle traffic outside of the temporary structure will include the transfer of empty and full waste packages into and out of the southeast corner of the temporary structure with a forklift, and transferring full waste packages to and from the Waste Package Staging Area. Waste packages containing inerted depleted uranium materials will be transferred via forklift from the Waste Package Staging Area to the waste package loading area where they will be loaded into the waste transport vans.

One to two transport vehicles will be staged at the waste package loading area during excavation operations. Packages containing inerted depleted uranium waste will be loaded into the vehicles each time a complete load of packages has been generated. Subsequently, the frequency of waste loads will depend on the pace of excavation and inerting operations. One or more flagpersons, wearing orange vests, may be positioned along the East Access/Central Avenue Road to control traffic during times of arrival and departure of the waste transport vehicles. Traffic may temporarily be stopped at the intersection of the northern-most west-bound lane and the Sewage Treatment Plant Access Road (Figure 2-1). Arrivals and departures of the waste transport vehicles will be scheduled before or after peak traffic hours, if possible. Empty transport vehicles will enter RFETS through the East Access Gate. Loaded transports will likely depart the site to the west on Central Avenue and exit RFETS through the West Access Gate.

Other traffic outside of the temporary structure will include deliveries of fuel and equipment, as needed. Fueling of heavy equipment will be performed as specified in ER *Operations Order No. OO-T1-06, Refueling of Heavy Equipment Within the Temporary Structure.* In support of the project emissions assessment by K-H Air Quality Management, RMRS will track gasoline and diesel fuel consumption at the Trench 1 site.

In the event of an emergency situation at the Trench 1 site requiring emergency evacuation and response activities, Wackenhut security personnel will assume the role of site security/control including the control of vehicular traffic.

6.13 DECONTAMINATION OF EQUIPMENT

Decontamination activities will be performed as described in Section 7.5 of the HASP (RMRS, 1998b). Materials and equipment may require decontamination prior to release from the temporary structure and prior to unrestricted release from RFETS to off-site locations. Decontamination methods will vary depending on the location and extent of contamination. Decontamination effectiveness will be determined by visual inspection, radiological monitoring, and VOC monitoring. At the discretion of the project manager, items may be decontaminated in the field or transferred to the Main Decontamination Facility. Field decontamination will be conducted in accordance with *FO.03, Field Decontamination Operations.* Main Decontamination Facility operations will be conducted in accordance with *FO.04, Decontamination of Equipment at Decontamination Facilities*, and *FO.17, Main Decontamination Facility Operations.*

6.14 DECONTAMINATION OF TEMPORARY STRUCTURE

At the completion of excavation activities, radiological surveys will be conducted inside the temporary structure following ROI *3.01, Performance of Surface Contamination Surveys*. Decontamination of the temporary structure will be conducted, as necessary, based on the survey results. A Property/Waste Release Evaluation will be prepared by RFETS Radiological Engineering following RFETS procedures for release of property/waste for conditional and unrestricted use.

6.15 OFF-SITE TREATMENT OF DEPLETED URANIUM WASTE

All potentially pyrophoric depleted uranium material received at the Starmet facility in Barnwell, South Carolina will be treated to eliminate the pyrophoric characteristic by calcining. Calcining will convert the depleted uranium metal into uranium oxide (U_3O_8). Concentrated depleted uranium, if present, will be processed and recycled into DUCRETE, a high-density concrete product made using depleted uranium aggregate (DUCRETE is a trademark of Lockheed Martin Idaho Technologies Company licensed to Starmet for the production of uranium shielded products). The remaining depleted uranium oxide and contaminated soil will be compacted into briquettes and containerized for direct shipment from the Starmet facility to a licensed disposal facility. The material for disposal will be stabilized to be compliant with the selected disposal facility's waste acceptance criteria (WAC).

Treatment operations at the Starmet facility will be conducted following the RMRS-approved Starmet documentaion, including a project-specific Health and Safety Plan (Starmet, 1998b), Starmet Quality Assurance Project Plan (Starmet, 1998d) and Starmet Standard Operating Procedures. Waste packaging will be performed in accordance with ER *Operations Order No. OO-T1-07*. All treatment operations and waste packaging at the Starmet facility will be inspected by RMRS representatives. Starmet will provide the RMRS representatives with any information needed to inspect the waste materials and create waste manifests. Starmet will maintain records of all materials received from RFETS including shipping manifests, receipt documents, storage documents, process documents, final waste forms, weights or volumes, and packaging documents.

6.16 SITE RECLAMATION

Near the completion of the project, a visual survey for potential hydrocarbon contaminated soil will be performed at the Trench 1 site. Hydrocarbon impacted soil will be removed and sampled for appropriate characterization and disposition as appropriate. In addition, a final radiological survey will be performed over the excavation and soil stockpile areas using the similar grid spacing as the preliminary surveys. Any remaining soil which appears to be radiologically impacted will be removed, characterized and disposed of before regrading and site reclamation activities.

Site reclamation will involve backfilling of soil into the excavation and revegetation of the site. Backfilling of the excavation will commence upon confirmation that the excavation and soil stockpile verification soil sample results meet or are below the RFCA Tier I action levels for radionuclides and VOCs. Clean fill will be utilized to backfill, as needed, in addition to the stockpiled soil below action levels.

A front-end loader and, if needed, a track-mounted excavator will be used for backfilling the excavation. Particulate dust monitoring and dust suppression with potable water will be performed during the soil transport and backfilling activities. Radiological air sampling will be performed during periods of soil movement or other dust generating activities in accordance with the *ALARA Job Review for Individual Hazardous Substance Site (IHSS) 108 Trench 1 (T-1) Source Removal Project* (RMRS, 1998e).

Following dismantling and removal of the temporary structure, topsoil will be returned to the site. The topsoil will be graded and the site will be revegetated with an appropriate seed mixture to return the site to an improved natural condition. Revegetation of all disturbed areas will be performed in accordance with the guidance provided by RFETS ecologists (Appendix D) and as per the Trench 1 Source Removal revegetation IWCP.

7.0 SPILL RESPONSE AND CONTAINMENT

The Trench 1 excavation activities may cause incidental spills of contaminated soil, or other hazardous materials inside the temporary structure. A spill involving mineral oil or Cimcool at the SIP is also considered to be an incidental spill. Incidental spills of hydraulic oil, motor oil or fuel are also possible outside of the temporary structure. The following spill response procedures will be performed to contain, control, and cleanup potential incidental spills: *Emergency Response and Spill Control Procedure (1-NO8-HSP-21.04)* and *Occurrence Reporting Procedure (ADM 16.01)*, and RFETS incidental release response actions and occurrence reporting requirements (DOE Order 5000.3).

No incidental spills of contaminated soil or hazardous materials are anticipated outside of the temporary structure since all contaminated soil or hazardous materials generated during the project will be packaged in RFETS-certified waste packages before being transferred outside of the structure. Once outside of the structure, the waste packages will be staged within the Waste Package Staging Area pending off-site disposition. General inspections of the Waste Package Staging Area will be conducted weekly as described in Section 8.0.

Prompt notification of the Field Operations Deputy Project Manager and the Shift Superintendent (extension 2914 or radio 3310) will be made reporting the type, volume, time, and spill response actions to be performed to contain the incidental release. If the spill involves potentially radioactive contaminated soil or materials, Radiological Safety, Radiological Engineering, and Air Quality Management will also be notified. Project personnel will be adequately trained and have the proper PPE and equipment to respond to most potential spills within the temporary structure.

If the release is not incidental and cleanup cannot be performed in a safe manner, the release requires implementation of the emergency spill response procedures per the site-specific HASP (RMRS, 1998b). In the event of any release outside the project area of a hazardous material, specifically a hazardous waste or radioactive material, the following actions will be taken:

- Personnel should warn others, and attempt to stop the release at the source, if it can be done safely;
- If it is not possible to stop the release, evacuate the area;
- Notify supervision;
- Call extension 2911 and report the release;
- Isolate the area to prevent traffic through the release; and
- Minimize personnel exposure to the hazards.

Occurrence reporting requirements per ADM 16.01 and DOE Order 5000.3 states that DOE and DOE contractor line management will be kept fully and currently informed of all events which could:

- Affect the health and safety of the public;
- Seriously impact the intended purpose of DOE facilities;
- Have a noticeable adverse effect on the environment;
- Endanger the health and safety of workers; or
- Adversely affect the national security or the security interests of DOE.

If any of the above incidents occur, personnel should notify supervision, fire and emergency at extension 2911, and the shift superintendent at extension 2914. Personnel will report their name, organization, phone or radio number, location of occurrence, time of event, and the nature and seriousness of the event per procedure ADM 16.01 and COOP-015 (Appendix A).

8.0 GENERAL INSPECTIONS

General inspections of Trench 1, include the work areas and waste packaging staging areas inside the temporary structure and the Waste Package Storage Area outside of the structure. The Trench 1 site will be inspected for possible malfunctions and deterioration, operator errors, and discharges that may cause or may lead to the release of hazardous waste constituents to the environment or a threat to human health. The inspections will be conducted during regular operating hours to attempt to identify and correct potential problems. A controlled log book or logsheets will be used to record the inspection dates/times and document findings. An inspection log form will be used for weekly inspections of the Waste Package Storage Area. At a minimum, these records will include the date and time of the inspection, the name of the inspector, a notation of the observation made, and the date and nature of any repairs or other remedial actions.

9.0 REFERENCES

Department of Energy (DOE), Order 5400.3

Department of Energy (DOE), Order 5480.19

Department of Energy (DOE), 1996, Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, Colorado.

Kaiser Hill Company, L.L.C., 1996, Rocky Flats Environmental Technology Site Radiological Control Manual, Rocky Flats Environmental Technology Site, Golden, Colorado.

Kaiser Hill Company, L.L.C., 1998, Trench 1 Source Removal Air Monitoring Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

RMRS, 1998a, Final Proposed Action Memorandum for the Source Removal at Trench 1, IHSS 108, Rocky Flats Environmental Technology Site, Golden, Colorado, RF/RMRS-97-011, Rev. 4, July.

RMRS, 1998b, Site-Specific Health and Safety Plan for the Source Removal at Trench 1 Site, IHSS 108, Rocky Flats Environmental Technology Site, Golden, Colorado, RF/RMRS-97-010, March.

RMRS, 1998c, Sampling Analysis Plan to Support the Source Removal at the Trench T-1 Site, IHSS 108, Rocky Flats Environmental Technology Site, Golden, Colorado, RF/RMRS-98-205, March.

RMRS, 1998d, Safety Analysis for Individual Hazardous Substance Site (IHSS) 108, Trench 1 (T-1) Source Removal Project, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

RMRS, 1998e, As Low as Reasonably Achievable (ALARA) Job Review for Individual Hazardous Substance Site (IHSS) 108 Trench 1 (T-1) Source Removal Project, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

Starmet, 1998a, Starmet Pyrophoric Depleted Uranium Source Removal from RFETS T-1 Trench (IHSS 108) Work Plan, April.

Starmet, 1998b, Starmet Pyrophoric Depleted Uranium Source Removal from RFETS T-1 Trench (IHSS 108) Health and Safety Plan, April.

Starmet, 1998c, Starmet Pyrophoric Depleted Uranium Source Removal from RFETS T-1 Trench (IHSS 108) Sampling and Analysis Plan, April.

Starmet, 1998d, Starmet Pyrophoric Depleted Uranium Source Removal from RFETS T-1 Trench (IHSS 108) Quality Assurance Project Plan, April.

Appendix A

Conduct of Operations
Implementation of COOP for Trench 1

CONDUCT OF OPERATIONS (COOP)
Implementation of COOP for Trench 1 Project
April 1998

1-31000-COOP-001 CONDUCT OF OPERATIONS

Purpose: Provides requirements, guidelines, and instructions to ensure that operations and support activities are conducted in a manner consistent with RFETS goals, objectives, and approved procedures in accordance with DOE Order 5480.19. COOP responsibilities as described in COOP-001 (Shift Manager, Facility Manager, etc.) assigned to project management staff per Operations Order OO-T1-02, Organization, Roles and Responsibilities.

COOP-001 is implemented as described below for each of the subsections.

1-31000-COOP-002 INTERNAL SURVEILLANCE PROGRAM

Purpose: Describes the process for conducting management internal surveillance of activities to help ensure operations are safely and efficiently performed.

Personnel from RMRS Quality Assurance will perform internal surveillances of field activities conducted by RMRS and subcontractor personnel. RMRS management will conduct assessments in accordance with Director/Group Manager schedules.

1-31000-COOP-003 CONTROL OF ON-SHIFT TRAINING

Purpose: Establishes the necessary on-shift evaluation and qualification training requirements for all on-shift instructors, and operations and support personnel.

Project personnel comply with COOP-003 with all onsite training requirements and three-day On-the-Job-Training (OJT) for hazardous waste operations. Subcontractors will also comply with COOP-003 with project-specific training performed onsite and the three-day OJT for hazardous waste operations. Day shift operations only.

1-31000-COOP-004 VITAL SAFETY SYSTEMS OPERATIONAL STATUS

Purpose: This procedure is applicable to the RFETS nuclear facility buildings and is not applicable to the Trench 1 project as the project does not utilize Vital Safety Systems.

1-U70-COOP-005 AUTHORIZATION BASIS TRACKING AND DOCUMENTATION

Purpose: Describes the process for tracking and documenting Limiting Conditions for Operation (LCO) surveillances and Operational Safety Requirements (OSRs) compliance-related compensatory measures associated with Unreviewed Safety Question Determinations (USQDs), Engineering Operability Evaluations (EOEs), and Justifications for Continued Operations (JCOs).

An Auditable Safety Analysis was prepared for the Trench 1 project which classified the project as a "radiological" facility. The Auditable Safety Analysis was reviewed and approved by the RMRS Operational Review Committee. The Trench 1 project does not have LCO, OSR, or compensatory measures from USQD, EOE, or JCOs.

1-31000-COOP-006 OPERATING AREA AND LOGS

Purpose: Defines the process for identifying and controlling operating logs and other records to ensure maintenance of complete and accurate operational histories. Environmental Restoration Management systems which do not affect, connect to, or interface with RFETS systems or utilities and which are owned and being operated by subcontractors, are exempt from this procedure.

The subcontractor (Starmet Corporation, Concord, Massachusetts) and RMRS will maintain controlled logbooks per 2-S47-ER-ADM-05.14, Use of Field Logbooks and Forms, to document field activities during the implementation of the Trench 1 project.

1-31000-COOP-007 SHIFT RELIEF AND TURNOVER

Purpose: Describes requirements, guidelines, and actions to be taken during shift relief and turnover to ensure effective communication of system and process operating parameters, routine, and scheduled shift activities, and unusual or off-normal conditions.

Shift relief and turnover and staff changeovers is required for the scope of the Trench 1 project, due to backshift and weekend tours performed by Building 374 Water Management and Treatment personnel.

1-31000-COOP-008 CONTROL OF CAUTION TAGS

Purpose: Describes the process for controlling Caution Tags to continue operating equipment and facilities when situations arise that require special temporary cautionary measures.

This procedure applies to Trench 1 operations and the Field Supervisor will defer to the Lockout/Tagout manager for either a Caution Tag or Lockout/Tagout of the affected equipment. Lockout/Tagout of affected equipment will be performed in accordance with HSP 2.08.

1-31000-COOP-009 CONTROL OF INFORMATION TAGS - CANCELED

1-31000-COOP-010 CONTROL OF OPERATOR AIDS

Purpose: Defines the process for controlling operator aid postings and information tags for the safe operation of RFETS.

This procedure is applicable and Trench 1 project management personnel will control and post operator aids as applicable. Operator aids will be controlled and maintained by the Field Operations Deputy Project Manager.

1-31000-COOP-011 PRE-EVOLUTION BRIEFING

Purpose: Describes the process for preparing, scheduling, and conducting Pre-Evolution Briefings (PEBs) to identify and address Conduct of Evolution to mitigate potential impacts to the public health, safety, or the environment resulting from a scheduled evolution.

This procedure is applicable to all phases of the Trench 1 project. A PEB is given to all team members prior to each task. The Trench 1 project will have a PEB prior to the site preparation, excavation, inerting, and site reclamation tasks and when there are changes in scope of a task or for new personnel.

1-31000-COOP-012 SHIFT OPERATING ROUNDS

Purpose: Provides instructions for performing operator rounds to monitor and record system and process parameters for each operating shift. Requires operations personnel to tour operations once per shift. Used to identify and correct undesirable trends and equipment problems and to facilitate turnover of equipment status (COOP-007). This procedure will be used as applicable.

1-31000-COOP-013 STANDING, SHIFT, AND OPERATIONS ORDERS

Purpose: Provides procedures for development, approval, distribution, revision, cancellation, and maintenance of Standing, Shift, and Operations Orders.

Trench 1 site personnel will comply with any Standing, Shift, and/or Operations Orders which apply to project operations. The Field Operations Deputy Project Manager will control and maintain Trench 1 Operations Orders as applicable.

1-31000-COOP-014 INDEPENDENT VERIFICATION

Purpose: Describes administrative controls to perform Independent Verification (IV) for components and system alignment. Required for valves, breakers, and other components in any system that provides life support (e.g., breathing air) to personnel. Required for valves, breakers, and other components in any system that could result in a release of hazardous materials or energy where personnel and environmental safety is concerned.

This procedure is not applicable to the breathing air system used for the Trench 1 project. The Trench 1 breathing air system is a portable cascade breathing air system where an air trailer and air trailer operator are at the immediate area of breathing air use. The air trailer operator maintains surveillance of personnel using supplied air at all times. Ground personnel will utilize MSA ultralite quickfill, SCBA air equipment which is refilled by the individual ground personnel during use. The air trailer operator maintains eye contact with the ground personnel during refilling of the SCBA. The heavy equipment operators are provided breathing air from two 4,500 psig air bottles mounted on each of the equipment (excavator, front-end loader, forklift). Each piece of air equipment is equipped with alarm bells, which sound when air supply is low, and emergency egress air supply bottles. Air gauges and air equipment are examined and performance checked at the beginning of each work shift. Air tanks are refilled as necessary.

Project personnel are trained in the use of the air equipment prior to initiating work. Grade D certified breathing air is supplied by two portable 5,000 psig compressors supplied by the vendor. As part of the project-specific breathing air training, personnel are instructed on how to perform emergency egress if their air equipment fails.

1-31000-COOP-015 COMMUNICATIONS CRITERIA

Purpose: Defines the communication criteria required to ensure a complete and consistent exchange of information or instruction.

Applicable to all phases of the Trench 1 project. Ensures communications contain information or directions necessary to successfully achieve the desired result. Give directions that are explicit, understandable, and include: who is giving the direction; who is to perform the action; what is to be done and why; when it is to be done; what procedure, if applicable; and additional communication required (when to report the task is completed). Minimize multiple actions in verbal instructions, write down multiple actions or give several short verbal instructions after each task is completed. When verbally receiving data, write down the information and do not rely on memory. The recipient acknowledges all communications by repeating back the communication as necessary to ensure the originator's communication is understood. Reporting emergencies per procedures (e.g., HASP, FIP), and conduct communications so as to not interfere with timely mitigation of the emergency. Procedure details written., verbal, and hand signal and gestures to be used. Addresses telephone and two-way radio communication procedures. RMRS will, in addition to conducting communication in accordance with COOP-015, utilize an equipment status board and maintain field log books and forms per COOP-006.

1-31000-COOP-016 PLAN OF THE DAY

Purpose: Provides requirements, guidelines, and instruction with the Plan of the Day (POD) process used to control operations and maintenance activities at RFETS.

This procedure is applicable to all phases of the Trench 1 project. Project personnel schedule field work on the Environmental Restoration Plan of the Week, each week. During field work, a POD/tool box meeting is conducted each day by the field supervisor, covering lessons learned from the work completed the previous day and the scope of the work to be performed that day, and the industrial hygienist, covering the potential hazards and hazard mitigation which are summarized on the task-specific Activity Hazard Analyses. Team members are requested to provide input into the POD and are reminded that safety is first. Project staff will encourage subcontractors to be proactive in their own safety programs and challenge them to respond accordingly.

1-31000-COOP-017 CONTROLLED DEACTIVATION OF ALARMS

Purpose: Describes actions to be taken for deactivation and reactivation of all alarms affecting safety at RFETS and to ensure compliance with applicable Operational Safety Requirements (OSRs) and Limiting Conditions for Operations (LCOs).

Trench 1 will not be utilizing an alarm system which is applicable to OSRs or LCOs.

1-31000-COOP-018 VITAL SAFETY SYSTEM STATUS CONTROL

Purpose: Provides requirements, guidelines, and instructions for managing the status of a Vital Safety System (VSS) at RFETS.

This procedure is not applicable to the Trench 1 project since the project will not utilize VSS operating status control or uses a component of a VSS.

1-31000-COOP-019 RETURNING SYSTEMS AND EQUIPMENT TO SERVICE
Procedure is canceled and incorporated into COOP-001.

1-31000-COOP-020 TERMINATION OF OPERATIONS PROCESS
Purpose: Provides instructions for determining the necessary scope of termination of operations, implementing the defined scope of termination of operations, and processing a JCO. Required by the OSRs for termination of operations, for both resumption and nonresumption facilities.

Trench 1 is classified as a "radiological" facility based on results of the Auditable Safety Analysis (March 1998). However, because Trench 1 is not considered an operating facility with engineered controls in place as the result of a safety analysis, this procedure does not apply to the Trench 1 project.

1-31000-COOP-021 OPERABILITY DETERMINATION PROCESS
Purpose: Provides instructions for all necessary reporting, communication, and control activities from the time a VSS deficiency is identified until an operability determination has been made.

This procedure is not applicable to the Trench 1 project as the procedure is a requirement of DOE Order 5480.5, Safety of Nuclear Facilities, and the project is classified as a "radiological" facility hazard classification.

1-31000-COOP-022 INACTIVATION OF EQUIPMENT AND AREAS
Procedure is canceled.

Appendix B

Trench 1 Quality Assurance Implementation Plan

TRENCH 1 QUALITY ASSURANCE PROJECT PLAN (QAPjP)

QUALITY ASSURANCE CRITERIA per 10CFR830.120

TRENCH 1 QUALITY ASSURANCE PROJECT PLAN (QAPjP)

QUALITY ASSURANCE CRITERIA per 10CFR830.120

QA criteria listed in this project plan are the required elements to comply with DOE's quality requirements as defined in 10CFR830.120. The application and implementation of these criteria into items and services shall be consistent with the graded approach. The graded approach is a "process of basing the level of application of managerial controls applied to an item or work according to the intended use of the results and the degree of confidence needed in the quality of the results" (E-4, ANSI/ASQC, 1994). The graded approach is also a function of safety (risk) and security required to accomplish program objectives (10 CFR 830.3).

In practical terms, the graded approach requires selective application of QA requirements and control to items and services commensurate with their importance to safety and project objectives. The USEPA states that "Environmental data operations encompass diverse and complex activities, and they represent efforts pertaining to rulemaking, compliance with regulations, and research. Consequently, any plan that is developed to represent how QA/QC should be applied to environmental activities must contain considerable flexibility..." (EPA, 1994a). The content and level of detail in this QA Project Plan is tailored to the nature of the work and associated risk with the T-1 Project. Hazardous and radiological risks, including catastrophic bounding conditions, have been thoroughly characterized for this project in the **Site-Specific Health & Safety Plan (HSP; RF/RMRS-97-010)**, the **ALARA Job Review (RF/RMRS-98-208)**, and the **Nuclear Safety Technical Report (RF/RMRS-98-215)**.

References cited in this document are included in Section 4.0, References, whereas RFETS-internal documents are referenced throughout this QA Project Plan by control numbers maintained at RFETS by either RMRS or Kaiser-Hill.

MANAGEMENT

Program

The T-1 quality program implements requirements set forth in 10CFR830.120, which are "flowed down" through the RFETS-specific quality documents of Kaiser-Hill **(K-H Team Quality Assurance Program, 12/15/97)** and RMRS **(RMRS-QAPD-001, Quality Assurance Program Description)**. Key personnel and organizations for project management are given in Figure 3-1 of the FIP **(Field Implementation Plan for the Source Removal at Trench 1, IHSS 108)**. The organization chart illustrates the infrastructure, functional responsibilities, levels of authority, and organizational interfaces necessary to accomplish the project's goals and RMRS's contractual commitments. Organizational roles and responsibilities are further delineated in the **Operations Order OO-T1-02, "Organizational Responsibilities"**.

The T-1 document hierarchy (Attachment 1) and QA Implementation Matrix (Attachment 2) provide a general perspective of the documents establishing the management structure in place for the T-1 project. Specific document and record control numbers may be obtained through review of the T-1 Project Files and/or the RMRS Records Center.

Personnel Training and Qualification

Personnel shall be qualified to perform their respective tasks based on a combination of education, training, and experience. Education and professional experience shall constitute the primary means of qualification for activities that emphasize problem-solving strategies, where creativity and innovation are essential components of optimizing the activity or item. Conversely, training shall be the primary means of qualification where:

- consistency and team coordination constitutes a major component of the overall quality (or safety) of the process or item, **and**
- the process is well established, proven, and perfunctory.

Training requirements specific to T-1 are given in Table 6.1 of the **HSP and in the T-1-specific list of qualified individuals (LOQI)**. In addition, a project-specific QA briefing will be given during the pre-evolution briefing prior to project start-up in the field, and to new personnel prior to their participation on the project. The QA briefing will cover the requirements stated in this QA Project Plan and will be documented via the pre-evolution attendance roster. QA personnel are qualified and certified per **RMRS-QA-02.01, "RMRS Qualification and Certification of Quality Assurance Personnel"**.

Fundamental education and experience are captured by transcripts and resumes, which are maintained by RMRS Human Resources or the subcontractor, as applicable. Site-specific and project-specific training records are managed within the T-1 Project File and the **K-H TSR (Training, Scheduling, and Records) database**. Qualification requirements and records may also be maintained through the project manager, individual staff, procurement (within contractual agreements), and/or a centralized training group within RMRS or the IMC (K-H). The T-1 QA Implementation Plan (Attachment 2) tabulates the documents and records that establish (i.e., plan and implement) T&Q within T-1 project.

Quality Improvement

Quality improvement shall be realized through use of a systematic means of identifying, tracking, and correcting problems (deficiencies, nonconformances, issues, etc.). Problems may be identified by any project personnel, at any time, through formal documentation of issues as stated in **RMRS-QA-03.01, "Corrective Action"**. Management and independent assessments will also be used to identify, track, and correct issues (Sections 3.1 and 3.2). The extent of causal analysis and corrective action shall be commensurate with the significance of the failure or problem. "Lessons Learned" shall be communicated to staff from management where appropriate.

Documents and Records

Work-controlling documents, such as work plans (including Integrated Work Control Packages -- IWCPs), standard operating procedures, Health and Safety Plans, etc., shall be controlled, where "control" is constituted by the following criteria:

- the documents are uniquely identified for reference purposes;
- the required reviews and approvals are accomplished; and,
- the personnel, who need the documents to perform work, receive the latest approved versions of the document(s).

The document control process is described in RMRS procedure **DC-06.01, "Document Control Program"**. Essential policies, plans, procedures, decisions, data, and transactions of the project will be documented to an appropriate level of detail. The objective shall be to maximize the utility of records and data for accomplishment of performance objectives while minimizing the cost of information management and paperwork for the project (RMRS) and its subcontractors. The documents controlling this project are summarized in Attachment 1 and are tabulated in Attachment 2.

All documents that constitute contractual deliverables (from RMRS to the client), such as work plans or final reports, shall undergo a minimum of three reviews, internally within RMRS, to ensure that minimum quality requirements are met:

- a management review (level of management higher than originating author(s));
- a technical/peer review (as determined by management); and,
- a quality assurance review.

The project manager will assign other technical reviewers, as applicable, to cover the technical disciplines represented within the document.

Quality records, including digital data stored on computerized media, shall be managed to ensure that information is retained, retrievable, and legible. Active records will be maintained by project personnel, including RMRS subcontractors, in an organized and retrievable fashion, until such time that the records have served their purpose and become inactive. Quality records are considered active until the final peer reviews are conducted, thus, quality records are not subject to the 30-day limit on turnover to the Records Center until final peer reviews are conducted. Peer reviews of records must be conducted on records completed by the originator within two (2) weeks of completion. Records at the job-site shall be stored and protected in fire-safe boxes.

Quality records managed by subcontractors will be acquired by RMRS through the standard processes of procurement and subcontracting. Only inactive records will be sent and maintained in records storage facilities. Records turnover and archival are controlled through **RM-06.02, "Records Identification, Generation, and Transmittal"**.

Quality records resulting from direct measurements or technical sampling activities shall be authenticated by the originator and subsequently authenticated by a peer reviewer ("QC checked"). For data uploaded to computer from the quality records described above, final data entry (as portrayed on hardcopy output) must be reviewed by someone other than the data entry person, and the hardcopy must be authenticated by the reviewer; errors on quality records shall be corrected by striking through the original entry with a line, and incorporation of the correct data adjacent to the strike-out. Authentication is also required for corrections.

The documents that control this project, as well as the (quality) records that will corroborate implementation of the controlling documents, are summarized graphically in Attachment 1, and are listed in Attachments 2 and 3. Documents and records to be placed in the CERCLA Administrative Record shall be dispositioned via **RM-06.04, Administrative Record Document Identification and Transmittal.**

Kaiser-Hill Analytical Services is responsible for all original records produced concerning lab-generated chemistry and radiochemistry data; the T-1 project will use data as provided by K-H Analytical Services or their subcontractors.

PERFORMANCE

Work Processes

Workforce

Management shall hire and maintain a workforce capable of performing the project objectives as set forth in the PAM and the FIP. Establishment and maintenance of the workforce for this project shall be within budgetary constraints as defined by the IMC (K-H).

Individual workers are responsible for the quality of their work. Management shall provide the workforce with the tools, materials, and resources (including training) necessary for successful accomplishment of their assigned tasks. Performance criteria for personnel shall be established and clearly communicated to the individuals.

Material Resources

Materials and equipment that affect quality (of items or services) or health and safety shall be controlled, i.e., identified, maintained, and traceable according to its intended purpose. Measurement, monitoring, and data collection equipment shall be of the accuracy and resolution needed for their intended purposes based on calibrations. Calibrations shall be traceable to nationally recognized or industry standards. Essential policies, plans, procedures, decisions, data, and transactions of the project will be documented to an appropriate level of detail.

Design

General

Sound engineering/scientific principles and appropriate technical standards shall be incorporated into designs to ensure that they perform as intended, including use of the RFETS Conduct of Engineering Manual.

Final designs, as documents, quality records, or computerized data, shall undergo validation through peer review. Peer reviews shall be commensurate with the scale, cost, specialty, and hazards of the item or activity in question. Management approval, in addition to peer and quality reviews of designs, shall be effected prior to procurement, manufacture, construction, or field implementation. Peer and quality reviews are corroborated through

documented comment resolution of the design reviews.

Data Acquisition and Sampling

The Data Quality Objective (DQO) process (EPA, 1994; QA/G-4) has been adopted for all data collection activities for this project. Both the EPA and the DOE Office of Environmental Management have established the DQO process as policy (EPA QA/R-5 and DOE, 1994, respectively) for determining the types, quality, and quantity of data needed for environmental and waste management decision-making, while optimizing time and cost considerations.

Although the process is not explicitly laid-out in the seven steps for each data collecting activity, all data acquisition and sampling activities are associated with action levels for quantitative comparisons and subsequent decisions that allow error, or uncertainty, to be quantified. In particular, sampling and analysis for determining environmental and waste management decisions are captured in the RMRS and Starmet Sampling and Analysis Plans (SAPs; RF/RMRS-98-205 and RF/RMRS-98-220, respectively). Radiological monitoring for real-time health and safety data acquisition and consequent decision-making, is covered in the **Radiological Work Permit (RWP)** and the **ALARA Job Review (RF/RMRS-98-208).** The **Air Monitoring Plan (DOE memorandum 98-DOE-03303),** and **Operations Order OO-T1-08, "Ambient Air Monitoring within the Temporary Structure" also acquire environmental air data.** Industrial Hygiene monitoring is addressed in the RMRS HSP.

Computerized Systems (Software/Hardware)

Design-control of computerized systems shall be commensurate with the hazards associated with the process for which the computer system controls. Systems controlling critical health and safety processes shall be verified and validated as prescribed in either the T-1 HSP or the ROIs, and must simulate working conditions prior to usage in real settings. Such systems shall also be tested periodically to ensure functionality as defined in the **RFETS Radiation Control Manual** or the **T-1 HSP.**

Computerized systems used for data reduction and analysis shall be controlled to:

- ensure traceability of changes made to original data, and
- allow independent peer reviewers to relate inputs to outputs.

RMRS digital data shall be controlled after the **ERPD Software Management Plan (10/21/94), 2-G24-ER-ADM-19.01,** but is planned for revision during the summer of 1998. Computerized systems used for measurements shall be calibrated via "system calibrations", i.e., while integrated with the relevant transducers.

Procurement

Quality requirements shall be delineated in procurement and subcontract documents. All contracts (subcontracts) let by RMRS shall be reviewed for QA requirements to ensure that adequate quality controls are established and implemented by the subcontractor.

Suppliers or vendors shall be established and used according to the Procurement Levels defined in the Level 1 site procedure **1-W36-APR-111, "Acquisition Procedure for Requisitioning Commodities and Services".**

Inspection and Acceptance Testing

Items or activities that require inspections and/or acceptance testing will be specified in work-controlling documentation (e.g., work plans, standard operating procedures, data management plans, etc.). Acceptance criteria and any hold points shall be clearly defined, and will be based on manufacturer's specification unless otherwise stated. Measurement and test equipment (M&TE) will be accepted or rejected based on calibration information and pre-established tolerances, including unique identification, traceability, accuracy, resolution, measurement ranges, and acceptance/rejection criteria. Calibration standards shall be traceable to nationally recognized or industry standards.

ASSESSMENTS

Management Assessment

At least once during the fielding of the project, management shall evaluate the organization to determine the effectiveness of the Quality Assurance Plan and overall RMRS organization performance. Management assessments shall be documented through annual reports, periodic status reports, internal memoranda, or other suitable reporting means, and are performed according to **RMRS-QA-09.01, "Management Assessments".**

Independent Assessment

Independent assessments, in contrast to management assessments, shall be performed by personnel who are not directly responsible for the work being performed. Independent assessments are performed according to **RMRS-QA-10.02, RMRS Conduct of Surveillances** and **RMRS-QA-10.01, Independent Assessments.**

Independent assessments shall:

- be based on the RMRS QA Plan, and other controlling documents as necessary;
- evaluate the performance of work beyond the mere review of documents and records (i.e., relative to technical specifications and project-specific data quality objectives and associated management decisions);
- act as management advisory functions; and,
- view the organization being assessed as the "customer" of the assessment results, and strive to produce useful feedback on RMRS assets and liabilities with respect to the RMRS mission and performance objectives.

A schedule of RMRS assessments planned for the project is given in Attachment 4.

REFERENCES

10CFR830.120, Quality Assurance

10 CFR 830.3

ANSI/ASQC E4-1994. *American National Standard, Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs.*

DOE, 1994. T.P. Grumbly Memorandum to Distribution, *Institutionalizing the Data Quality Objectives Process for EM's Environmental Data Collection Activities*, September 7, 1994.

DOE, August, 1991. DOE Order 5700.6C

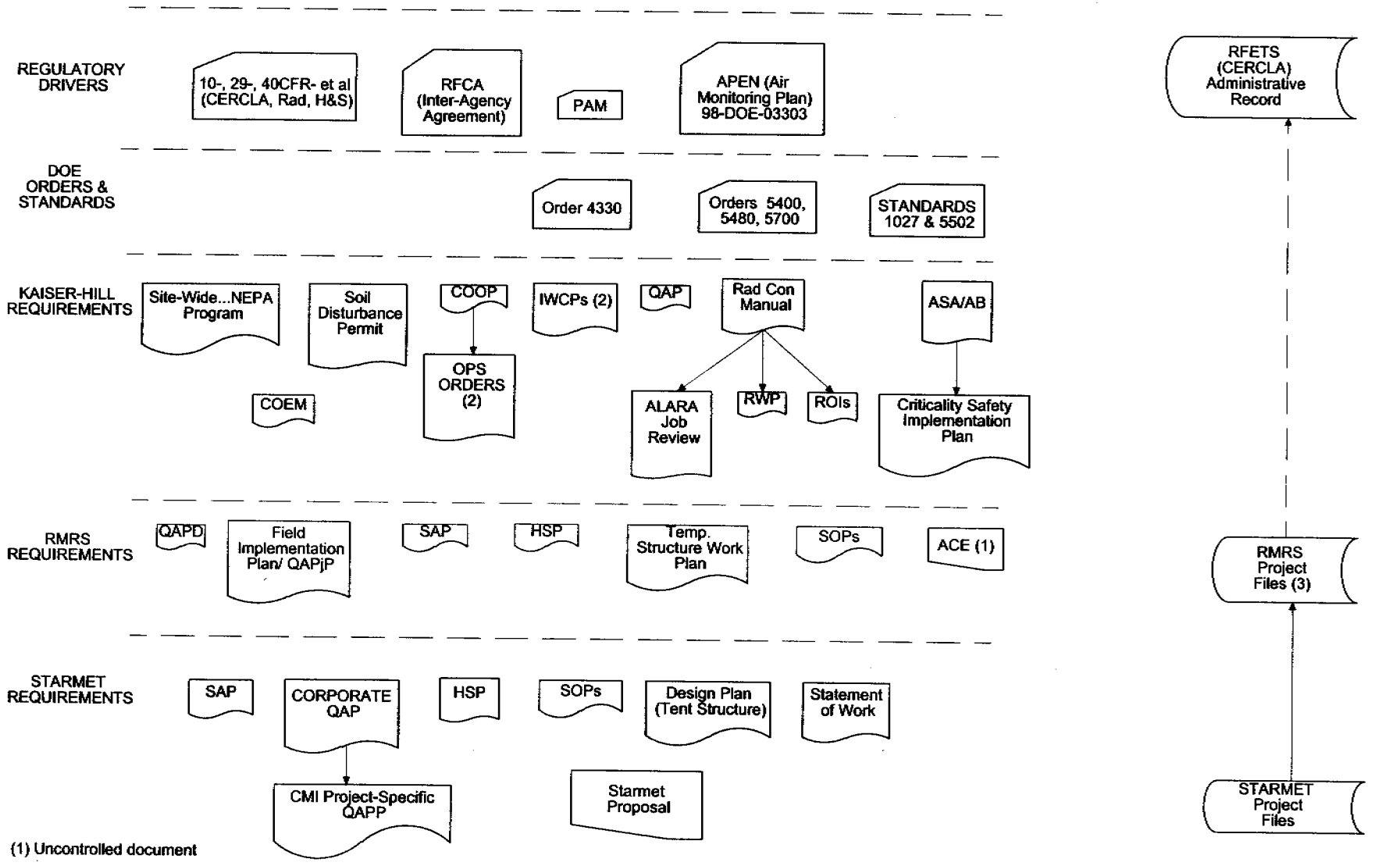
EPA, 1997. EPA Requirements for Quality Assurance Project Plans, QA/R-5

EPA, 1994. Guidance for the data quality objectives process, EPA QA/G-4

EPA, 1998. Guidance for the data quality assessment process, EPA QA/G-9

DOCUMENTS **RECORDS**

DOCUMENT HIERARCHY & QUALITY RECORDS for the T-1 TRENCH PROJECT, FY98



(1) Uncontrolled document

(2) see Attachment 2 for specific breakdown

(3) see Attachment 3 for specific breakdown

ATTACHMENT 1

QA/QC IMPLEMENTATION MATRIX for the T-1 PROJECT

QUALITY REQUIREMENT		PROOF of IMPLEMENTATION	CONTACT	PHONE
MANAGEMENT				
PROGRAM		Proposed Action Memorandum (PAM)	W. Sproles	x5790
		Rocky Flats Cleanup Agreement (RFCA)	L. Brooks	x6130
		RMRS QA Program Description	G. DiGregorio	x5688
		Starmet QAPP: CMI-RM708626PZ3	G. DiGregorio	x5688
		RMRS T-1 QAPjP (Appendix B of the FIP)	S. Luker	x7291
TRAINING/QUALS		Health & Safety Plan (HSP – lists requirements)	K. Gillespie	x5356
		RMRS Human Resources (Personnel Files)	S. Sutton	x2134
		Readiness Review (verifies personnel training)	M. Bemski	x4090
		Starmet Training & Qualification Records	M. Burmeister	x5891
		SOWs/Contracts (for subcontractors)	T. Vetack	x8170
		List of Qualified Individuals (LOQI)	R. Wagner	x3102
		TSR (Training: Scheduling & Records)[1]	B. DiSalle	x3735
QUALITY IMPROVEMENT		Plant Action Tracking System (PATS)	V. Valencia-Beckman	x6490
		Corrective Action SOP (RMRS-QA-03.01)	M. Prochazka	x4747
		RMRS QA Surveillance Reports	G. DiGregorio	x5688
CONTROLLING DOCUMENTS		Summarized Document Hierarchy; ACE & FIP	G. DiGregorio	x5688
		Document Control Index	K. Manzanares	x5430
		Subcontractor Statements of Work (SOWs)	M. Burmeister	x5891
		Control of RMRS Documents (DC-06.01)	K. Manzanares	x5430
RECORDS		Sampling & Analysis Plan Records	H. Salomon	x6627
		RMRS QA Surveillance Reports	G. DiGregorio	x5688
		Project History File (compendium)	A. White	x5180
		K-H Analytical Services (analytical/rad chem results)	V. Ideker	x3437
		T-1 Final Report(s)	W. Sproles	x5790
		H&S Quality Records (see Attachment 3)	K. Gillespie	x5356
		Radiological Quality Records (see Attachment 3)	J. Miller	x2454
		Administrative Record (AR)	L. Tyler	x4580
		Daily Shift Reports	R. Wagner	x3102
		Field Logbooks (controlled)	G. DiGregorio	x5688
		ER GIS Database (ARC/INFO; land surveys/GPS)	W. Cheeks	x7707

QA/QC IMPLEMENTATION MATRIX for the T-1 PROJECT

QUALITY REQUIREMENT	PROOF of IMPLEMENTATION	CONTACT	PHONE
PERFORMANCE			
WORK PROCESSES	RMRS QA Surveillance Reports	G. DiGregorio	x5688
	Field Implementation Plan	T. Spence	x4322
	IWCPs (Integrated Work Control Packages)	A. Helmick	x7604
	Install/Demobe 3 Field Trailers (T0093998)		
	Prepare T-1 Area for Trailer Installations (T0094267)		
	Minor Maintenance Craft Support for T-1 (T0094294)		
	Install Electricity/Communications to Trailers (T0094304)		
	Trench-1 Site Preparation - Rev 1 & Rev 2 (T0094955)		
	Install Site Power Distribution to T-1 Tent (T0095000)		
	Construct Temporary Structure at T-1 (T0095355)		
	Excavate Trench-1 (IHSS 108) (T0095380)		
	Operations Orders	S. Martin-Lewis	x6643
	Shift & Operations Orders Admin Procedure (OO-T1-01)		
	Organization Roles & Responsibilities (OO-T1-02)		
	Visitor Orientation (OO-Tt1-03)		
	Storage & Transfer of Potentially Pyrophoric Samples (OO-T1-04)		
	Use of MSA SCBA and Premaire Line Systems (OO-T1-05)		
	Refueling of Heavy Equipment w/in the Tent (OO-T1-06)		
	Waste Packaging (OO-T1-07		
	Ambient Air Monitoring w/in the Tent (OO-T1-08)		
	Temperature Measurements of DU w/ a Heat Gun (OO-T1-09)		
	Inspection of Emergency Response & Safety Equipment (OO-T1-10)		
	Trench-1 Shift Turnover and Tours (OO-T1-11)		
	Kaiser-Hill Radiological Control Manual (Rad Con Manual)	J. Barroso	x8451
	Radiological Operating Instructions (ROI)	J. Barroso	x8451
	Conduct of Engineering (COE) Manual	R. Wagner	x3102
	Conduct of Operations Manual	R. Wagner	x3102
	Starmet Work Plan	M. Burmeister	x5891
	Subcontractor Statements of Work (incl. Gamma Spec)	V. Ideker	x3437
	Starmet		
	Kaiser-Hill Analytical Services (incl. Gamma-Spec)		
	Air Monitoring Plan (w/in the APEN)	J. Jeanperrin	x5483
	Radiological Work Permit (RWP)	J. Barroso	x8451
	SOPs -- RMRS for RFETS and Starmet for Barnwell Facility	G. DiGregorio	x5688

QA/QC IMPLEMENTATION MATRIX for the T-1 PROJECT

QUALITY REQUIREMENT		PROOF of IMPLEMENTATION	CONTACT	PHONE
DESIGN		Authorization Basis (AB)/Audit. Safety Analysis (ASA) {Nuc. Safety Tech Report}	J. Kirar	x7844
		Activity Control Envelope (ACE)	W. Sproles	x5790
		IWCPs (listed above)		
		Sampling & Analysis Plans (RMRS & subcontractors)	H. Salomon	x6627
PROCUREMENT		SOWs (which include QA requirements)	W. Sproles	x5790
		T-1 QAPjP (Appendix B of the FIP)	S. Luker	x7291
		Approved Supplier List for selected purchases		
		Pre-Receipt Inspection Reports of subcon	G. DiGregorio	x5688
INSPECTION/ACCEPTANCE TESTING		calibration/maintenance records for M&TE	G. DiGregorio	x5688
		shipping manifests		
		waste travelers		
ASSESSMENTS				
MGMT		RMRS Mgmt Assessment Reports (memos)	M. Burmeister	x5891
INDEPENDENT		RMRS QA Surveillance Reports	G. DiGregorio	x5688
		RMRS QA Surveillance Schedule	G. DiGregorio	x5688
		Independent Assessments (RMRS-QA-10.01)	J. Hernandez	x2571
		K-H Assessment Reports	D. Gillespie	x2413
		[1]Sitewide database		

DETAIL OF QUALITY RECORDS[1]

HEALTH & SAFETY QUALITY RECORDS
- Daily Instrument Calibrations
- Daily H&S Logs (per person)
- Safety Compliance Agreement
- Daily IH Monitoring Logs (real time)
- Operators Daily Heavy Equipment Checklist
- Daily H&S Briefing Roster (tailgate meetings)
- Heat Stress/Cold Stress Monitoring Logs
- IH Air Sampling Form (lab samples)
- Overall Inspection Reports
- Employee Notification of Personal Air Sampling Results
- OSHA 200 Logs (may be plantwide, not project-specific)
- COCs for H&S Samples
- Checklist for use of SAR/SCBA Respirators

RADIOLOGICAL QUALITY RECORDS
- Radiological Dose Survey Forms (incl. survey map)
- Radiological Contamination Survey Forms (incl. survey map; DPM/100cm^2)
- Radiological Operations Alpha &/or Beta Surveys (incl. maps; CPM & DPM/100cm^2)
- Radiological Operations Gamma Surveys (incl. survey map; CPM & DPM/100cm^2)
- Air Sampling Results (incl. high vol., low vol, and CAMs)

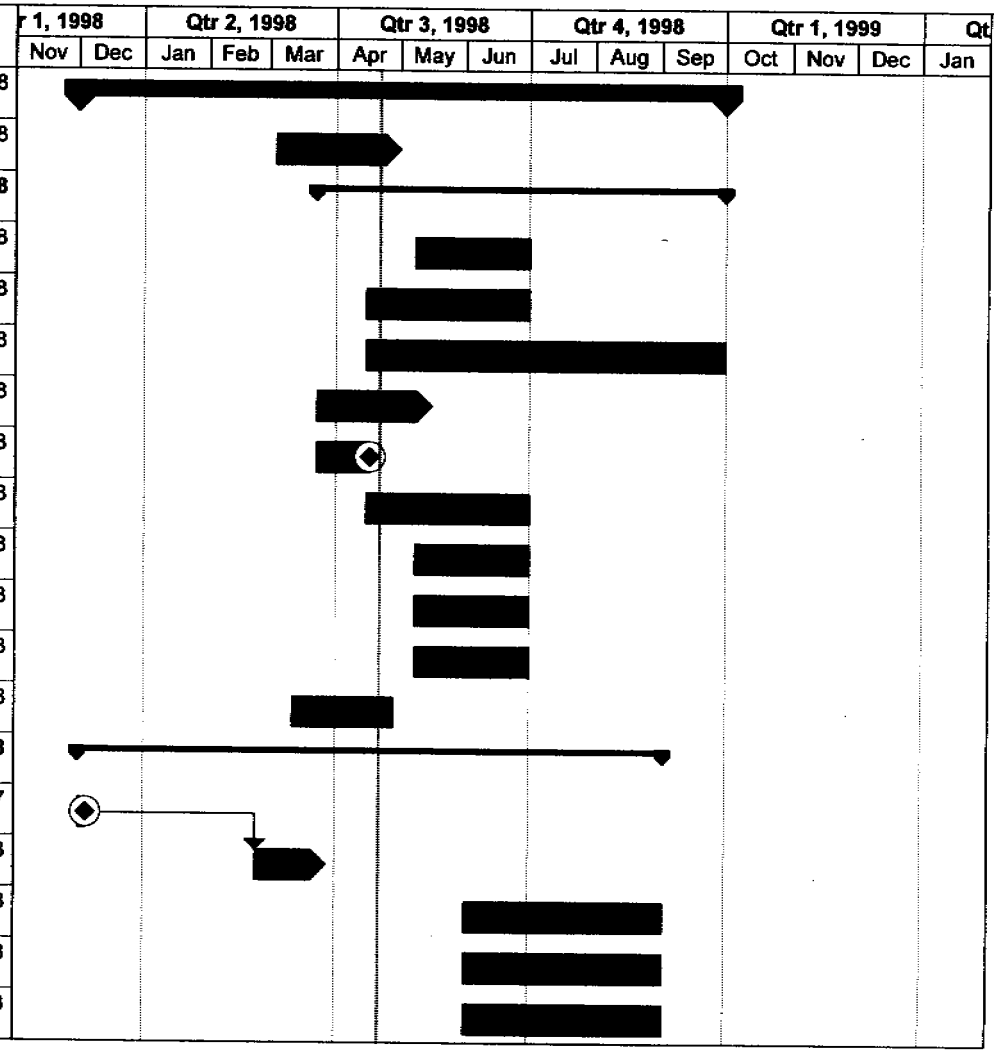
ADMINISTRATIVE RECORDS
- Field QA Records Transmittal Form

OTHER TECHNICAL QA RECORDS (related to implementation of SOPs)
- Equipment Decontamination/Wash Checklist
- Heavy Equipment Decontamination/Wash Checklist
- Verification of Organic Vapor Monitoring Results (FO.8)
- Chain of Custody (COC)
- Electronic Data Deliverables (EDDs; containing analytical & radiochemistry results in a database format)
- Waste Logs

[1]Generic titles of the records are listed; data may be archived digitally, which will be tracked by file name; dates & titles are managed through RMRS Document Control

TRENCH T-1 SURVEILLANCE SCHEDULE

ID	Task Name	Start	Finish
1	Trench T-1 Surveillance Schedule	12/1/97	9/30/98
2	Readiness Assessment	3/4/98	4/23/98
3	**Records**	**3/23/98**	**9/30/98**
4	sampling records	5/8/98	6/30/98
5	radiological records	4/15/98	6/30/98
6	miscellaneous records	4/15/98	9/30/98
7	training and qualifications	3/23/98	5/8/98
8	Tent Shelter	3/23/98	4/16/98
9	COOP Elements	4/15/98	6/30/98
10	Procedure Implementation and Work Processes	5/8/98	6/30/98
11	RMRS SAP	5/8/98	6/30/98
12	STARMET SAP	5/8/98	6/30/98
13	Measuring, Testing and Equipment	3/12/98	4/27/98
14	**STARMET Facility**	**12/1/97**	**9/1/98**
15	quality assurance program 1	12/1/97	12/4/97
16	quality assurance program 2	2/23/98	3/20/98
17	sampling	6/1/98	9/1/98
18	treatment	6/1/98	9/1/98
19	waste packaging	6/1/98	9/1/98



Project Trench T-1
Date 4/21/98

Task
Summary
Milestone
Completed Task

C:\WINPROJ\T-1SURV2.MPP

APPENDIX B

4/21/98

Appendix C

Project Phone List

Project Phone List

Name	Company/Title	Phone	Pager	Radio	Home
Aldridge, Steve	RMRS - Health and Safety Specialist	4183	508-2137	3719	[redacted]
Barbour, Don	Starmet - Project Manager	4518	-	EMAD6	
Barnes, Dave	RTG - Health and Safety Specialist	5352	3542	3748	
Barroso, Jeff	RMRS - Radiological Engineering	8451	5888	Site Surv	
Bemski, Mike	RMRS - Field Supervisor	4090	212-6271	3805	
Boyle, Jim	DOE - Facility Representative	9742	1-888-290-8786		
Burmeister, Mark	RMRS - Deputy Project Manager	5891	212-6228	-	
Casteneda, Norma	DOE - ER Projects	4226	4466	-	
Chandler, Skip	RMRS - H&S Team Leader	6673	1659	3806	
Cygnarowicz, Robert	RMRS - Project Support	7916	6143	-	
Cirillo, Russ	RMRS - Bldg. 891 Water Treatment	5876	4011	3765	
Cochran, Noelle	Starmet - Quality Assurance Officer	4518	-	EMAD6	
Coyne, Dan	RMRS - Maintenance	8177	7223	3411	
Demos, Nick	RMRS - Project Support	4605	212-6159	3810	
DeWitt, Stephanie	KH - IH&S Oversite	4750	8083	-	
DiGregorio,Greg	RMRS - Quality Assurance	5688	212-6206	-	
Farler, David	RMRS - H & S Supervisor	4340	5248	3743	
Findley, Michael	RMRS - Vice President ESH&Q	2653	5978	3763	
Garland, Kevin	RMRS - Radiological Safety Technical Manager	4310	7074	3277	
Gillen, Bill	KH - Senior Technical Advisor	2247	212-1974	-	
Gillespie, Ken	RMRS - Site Safety Officer	5356	4007	3733	
Greengard, Tom	KH - Program Manager	5635	212-1968	-	
Guild, Randy	Dyncorp - Contractor Yard	5302	6151	3811	
Hull, Kurt	Starmet - Assistant Project Supervisor	4518	-	EMAD6	
Jean-Perrin, Janelle	Radian, Air Quality	5483	-	-	
Jenkins, Ken	RMRS - H&S Team Leader	5374	7455	4505	[redacted]
Kirar, John	RMRS - Nuclear Safety	7844	7577	-	
Langsted, Jim	RMRS - Health Physicist	2542	3425	-	
Law, John	RMRS - Director, Environmental Rest.	4842	4564	-	
Lenarcic, Ken	KH - Transportation	2377	1780	-	
Lindsey, Tom	RMRS - Project Support	5705	212-5681	3757	
Lombardo, Nick	Starmet - Project Supervisor	4518	859-0751	EMAD6	
Lopez, Steve	Starmet - Health and Safety/Quality	4518	-	EMAD6	
Luker, Steve	RMRS - Quality Assurance	7291	-	-	
Martin Lewis, Sally	RMRS - Technical Support	6643	7333	-	
Mattheiss, Mark	RMRS - Radiological Coordinator	4719	475-2535	3271	
McCafferty, Ruth	RMRS - Industrial Hygiene	2244	3373	3794	
Miller, John	RMRS - Radiological Engineer	2454	7981	-	
Mobley, Steve	KH - Excavation Specialist	2538	212-5502	4508	
Myrick, Susan	RMRS - Field Supervisor	5051	4343	-	
Nims, Debra	Starmet - Health and Safety Program Manager	4518	-	EMAD6	
Omberg, Susan	RFETS Fire Protection Engineering	6294	1961	-	

Name	Company/Title	Phone	Pager	Radio	Home
Parker, Timothy	Rocky Flats Fire Department - Fire Chief	6043	3706	2001	[redacted]
Parson, Gary	KH - Excavation Specialist	4197	212-5508	4561	
Pepping, Mike	RMRS - Waste Generator	3075	212-6331	3808	
Peters, Mike	RMRS - Quality Assurance	5884	-	-	
Primrose, Annette	RMRS Field Operations Manager	4385	212-6338	3801	
Russell, Wade	RTG - Health and Safety Specialist	5356	6136	3728	
Salomon, Hopi	RMRS - Sample/Waste Manager	6627	212-6224	3779	
Schreckengast, Peggy	RMRS - H&S Supervisor	6790	3059	3702	
Spence, Tracey	RMRS - Field Supervisor	4322	6152	3812	
Sproles, Wayne	RMRS - Project Manager	5790	212-5651	3711	
Wagner, Rick	RMRS - Project Operations	3102	212-6363	3798	
Wood, Mark	RMRS - Project Support	6689	5904	3755	
Watson, Bruce	RMRS - Radiation Control Compliance	2627	7513	-	

Appendix D

Site Reclamation - Reseeding Guidance and Specifications

REVEGETATION PLAN
FOR T-1 TRENCH AND MOUND WORK AREAS

Based on recent experience at the Site, Kaiser-Hill (K-H) Ecologists have developed Site-specific guidelines for revegetation. Customized seed mixtures for each revegetation site help ensure that appropriate species for each location are planted, and that non-endemic species are not introduced. The customized seed mixture for this project is listed in Table 1. The current revegetation strategy is to restore the native prairie grasslands as closely as possible to preexisting conditions, rather than to change the character through reclamation and remediation. This strategy is in keeping with DOE Order 6430.1A (DOE 1989), and implements requirements called out in the Ecological Resource Management Plan (K-H 1997).

Reservation of Topsoil

Prior to construction, available topsoil will be stripped from the site of the proposed disturbance to a depth of 8 to 12 inches and stockpiled for later revegetation efforts. Because limited topsoil is available for revegetation of the project area, the project will need to procure weed-free topsoil from off-site to allow placement of a minimum of 6 to 8 inches of topsoil over the subsoil at the disturbance.

Seedbed Preparation

Once each disturbance has been filled and re-contoured, the subsoil will be ripped or scarified to a depth of 8 inches before topsoil placement. Scarification will be used to relieve soil compaction from heavy equipment. Topsoil will then be placed as evenly as possible in a 6- to 8-inch layer. Care will be taken during topsoil application to avoid compaction of this layer. Areas where heavy equipment was operated, but no excavation occurred, will also be ripped or scarified.

Seed Application

After the seedbed has been prepared, seed will then applied directly into the topsoil. Seeding will be performed using a no-till drill or broadcast seeding, depending on soil conditions (much of the soil at the Site is too rocky for drill-seeding), and other site-specific factors. If the seed has been broadcast, the reseeded area will be drag-chained or raked to ensure that the seed is buried prior to mulching.

Mulch Application

Hydromulch will be applied as a separate, final step. *Application of seed within the hydromulch is not an accepted practice at the Site.* The hydromulch will be applied to a thickness of 1 to 1.5 inches, the optimum application rate.

Only mulches bound by vegetable-based binders (tackifiers) are allowed for use on the Site, due to previous problems with petroleum-based binders leaching into the groundwater. Tackifying agents found to be "environmentally friendly" and chemically acceptable for use at the site are those based on guar gum, or Psyllium (alpha plantago). The product known by the brand name "SoilGuard" was also found to be chemically acceptable. Products with petroleum-based binders are not acceptable for use at the Site due to surface and groundwater contamination concerns.

Wood fiber or excelsior mulch material provides a weed-free mulch fiber that can be combined with the tackifiers for good effect. Several products of this sort are available on the open market. Wood chip and

bark chip mulches are not effective, and shall not be used. Reprocessed newsprint-type wood fiber mulch has yielded poor results at the Site and should not be used. The thick clumping and persistence of the papier-mache-like product may have inhibited good plant growth in one case.

Nylon netting has been prohibited for revegetation efforts at the Site. While the netting is an efficient means of stabilizing the mulch during the high winds often experienced at the Site, the clear evidence of songbird mortality caused by this netting has led Site ecologists to prohibit the use of netting. Killing songbirds is specifically prohibited by the Migratory Bird Treaty Act (MBTA); therefore, use of netting became a compliance issue.

Follow-up Actions

Limited or nonexistent success of a revegetation effort will require repeated attempts until successful revegetation is attained.

Table 1. Seed Mixture for T-1 and Mound Site Revegetation

Species	Application Rate (Lbs/ac PLS)[1]
Big Bluestem (*Andropogon gerardii*)	4.0
Side-oats Grama (*Bouteloua curtipendula*)	3.0
Little Bluestem (*Schyzachrium scoparium*[2])	3.0
Blue Grama (*Bouteloua gracils*)	3.0
Western Wheatgrass (*Agropyron smithii*)	2.0
Buffalograss (*Buchloe dactyloides*)	2.0
Blanketflower (*Gaillardia aristata*)	0.5
Blue Flax (*Linum perenne*)	0.5
TOTAL	18.0[1]

1) Application rate for drill seeding in pounds per acre of pure live seed. This rate should doubled for broadcast seeding.

2) Synonymous with *Andropogon scoparius*

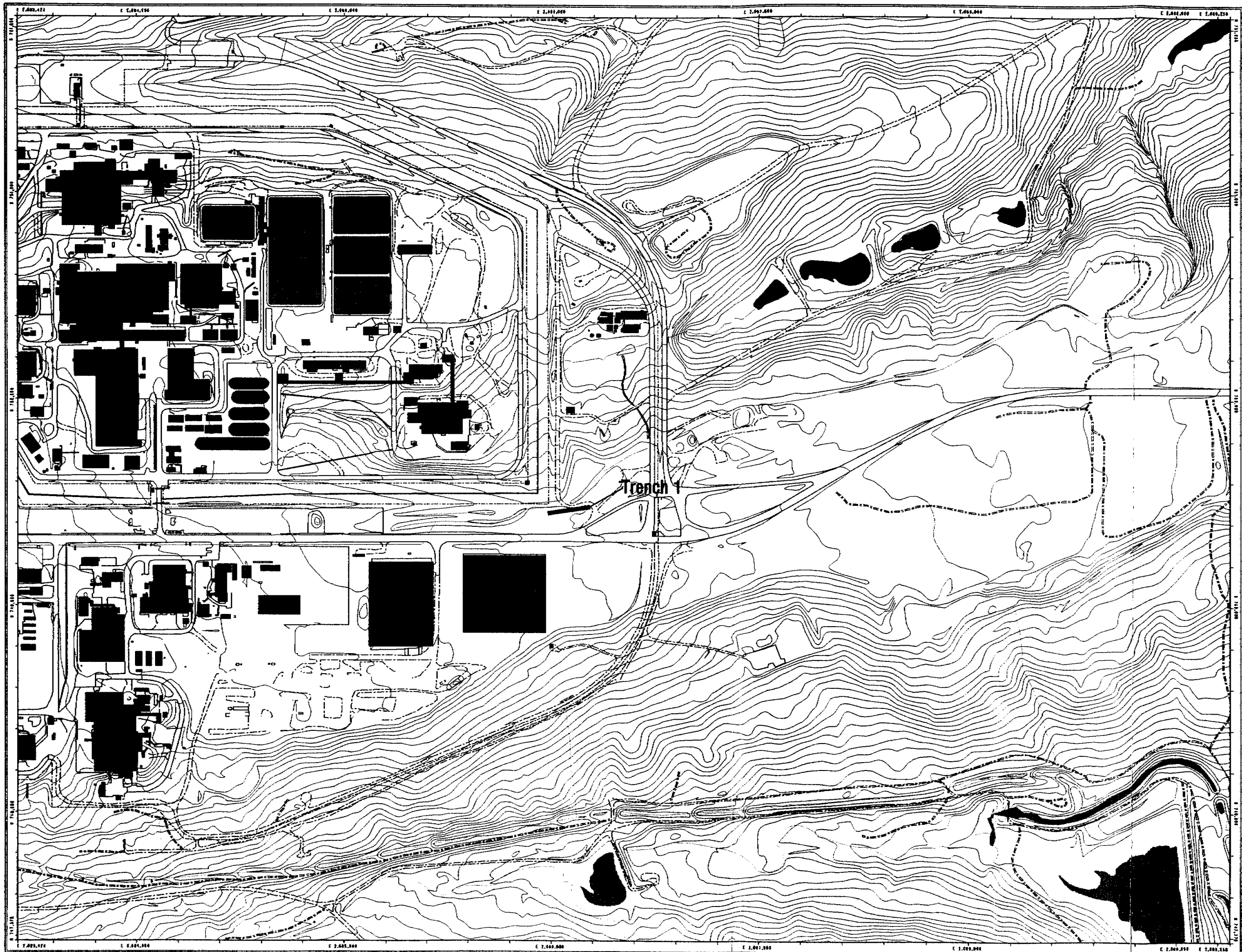


Figure 1-1

Trench 1
Site Location

EXPLANATION

- Contours (5' intervals)
- Trench 1

Standard Map Features

- Buildings and other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Paved roads
- Dirt roads

DATA SOURCES:
Buildings, fences, hydrography roads and other structures from 1995 aerial fly-over data captured by EG&G RSL, Las Vegas.
Digitized from the stereophotographs, 1/95

Scale = 1 : 5430
1 inch represents approximately 453 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
RMRS Rocky Mountain Remediation Services, L.L.C.
Geographic Information Systems Group
Rocky Flats Environmental Technology Site
P.O. Box 464
Golden, CO 80402-0464

MAP ID: 97-0066

April 15, 1996

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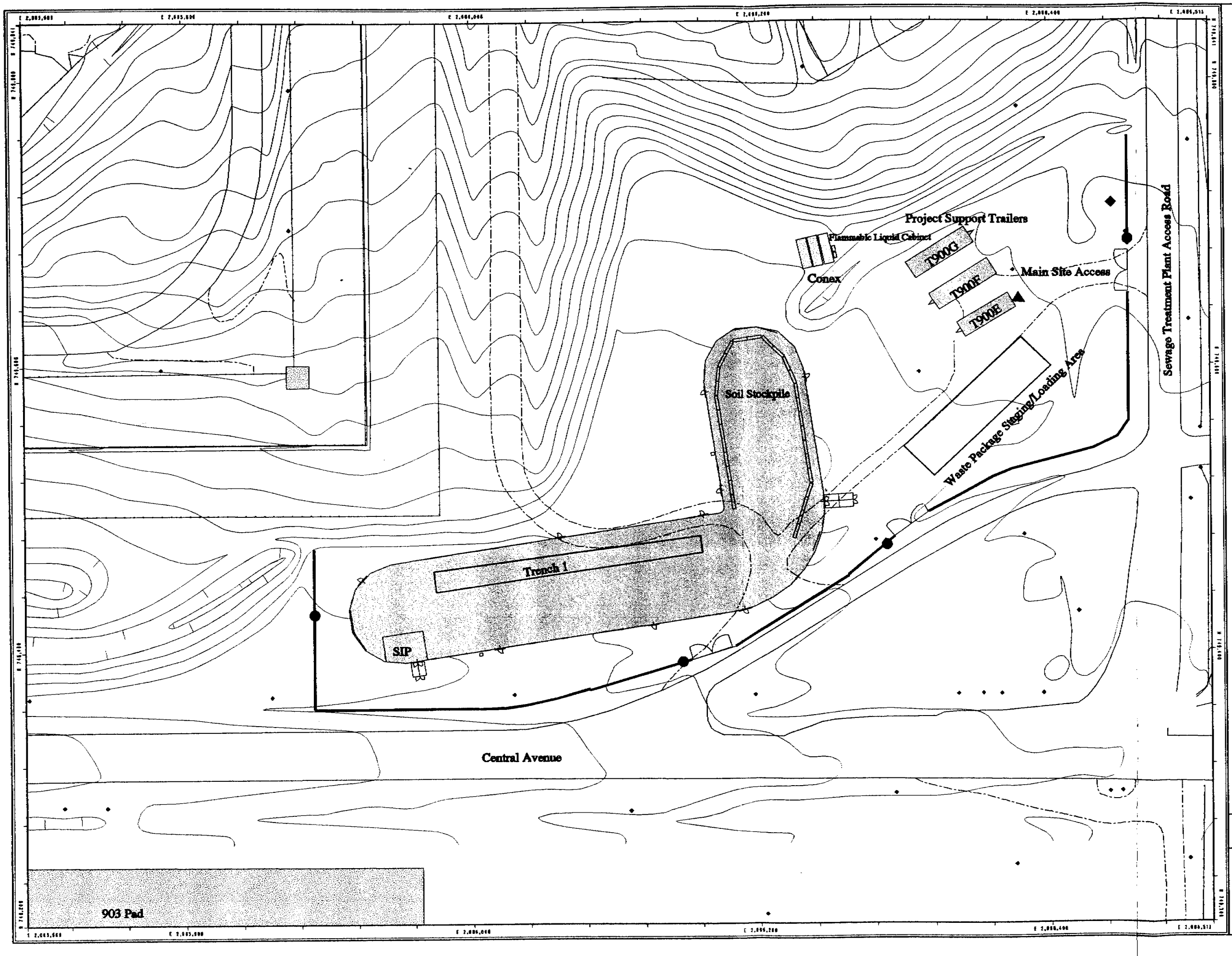
Trench 1
Site Layout
Figure 2-1



EXPLANATION

- Personnel Access Gate
- Personnel Accountability Tag Board
- Primary Assembly Area
- 2 Foot Contours
- Safety Fence
- Trench 1 Boundary
- Temporary Structure Boundary

SIP = Sampling and Inerting Pad

Standard Map Features

- Buildings and other structures
- Fences and other barriers
- Paved roads
- Dirt roads

DATA SOURCE:
Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSI, Las Vegas.
Digitized from the othophotographs. 1/96

Scale = 1 : 770
1 inch represents approximately 64 feet

25 0 50 100ft

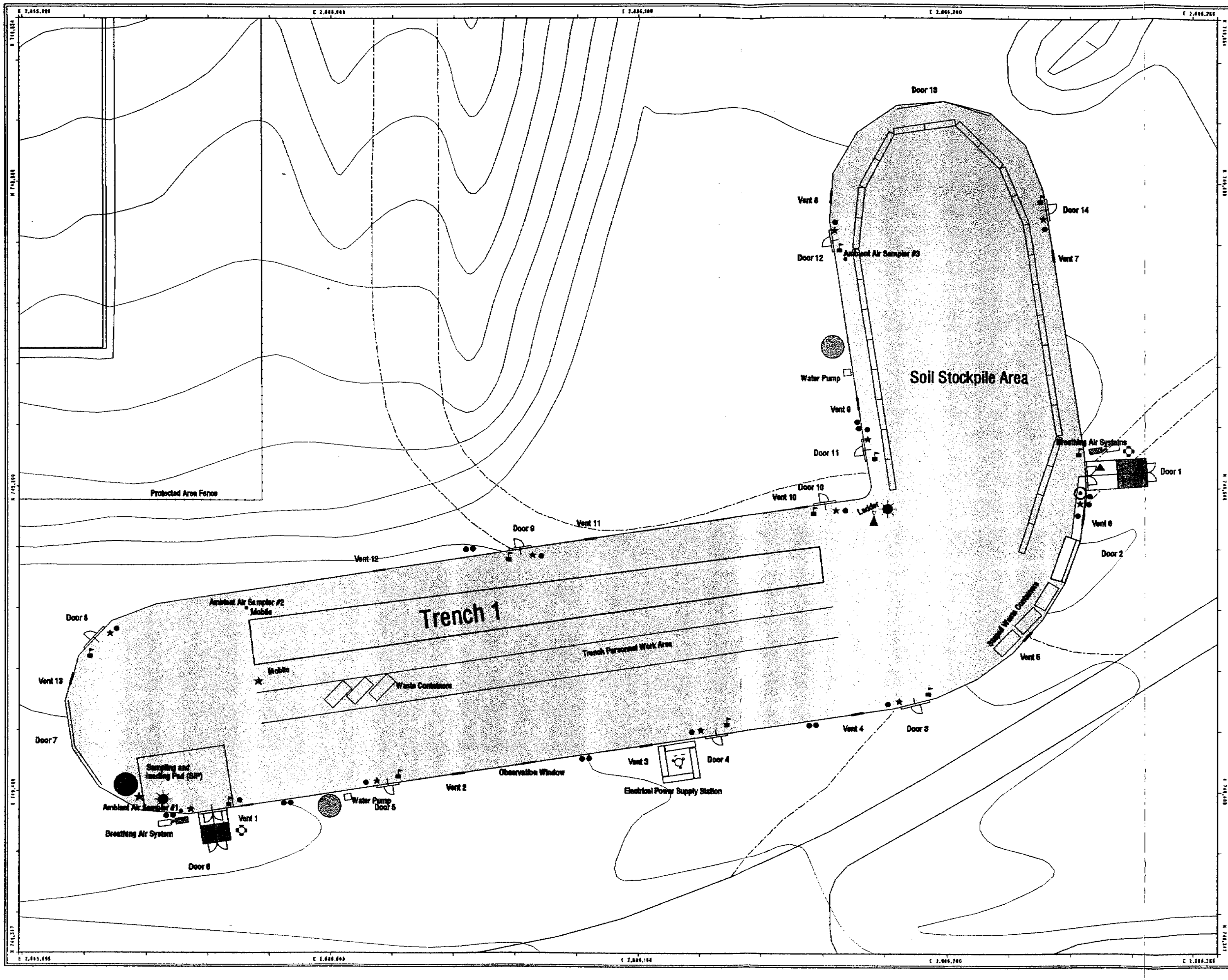
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
RMRS Rocky Mountain Remediation Services, L.L.C.
Geographic Information Systems Group
Rocky Flats Environmental Technology Site
P.O. Box 464
Golden, CO 80402-0464

MAP ID: 98-0115 April 30, 1998

Trench 1
Temporary Structure Layout
Figure 2-2



EXPLANATION

- 2 Foot Contours
- Trench 1 Boundary
- Radiological Buffer Area/Contamination Reduction Zone
- Contamination Area/Exclusion Zone
- High Contamination Area/Exclusion Zone
- Non-Potable H_2O
- Waste Liquid Storage
- 20 lb Class ABC Dry Chemical Extinguisher
- 50 lb Class ABC Dry Chemical Extinguisher
- 15 Minute Continuous Flow Emergency Shower and Eye Wash Station
- Spill Kit
- Emergency Ventilation Shutdown Button
- Air Horn Alarm
- Electrical Outlet
- Continuous Air Monitor
- Ambient Air Sampler
- 30 lb Class D MET-L-X Extinguisher
- 150 lb Class D MET-L-X Extinguisher

Standard Map Features

- Fences and other barriers
- Paved roads
- Dirt roads

N

Scale = 1 : 370
1 inch represents approximately 31 feet

0 5 10 20 40ft

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
RMRS Rocky Mountain Remediation Services, L.L.C.
Geographic Information Systems Group
Rocky Flats Environmental Technology Site
P.O. Box 464
Golden, CO 80402-0464

MAP ID: 96-0146

April 30, 1996

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